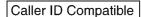# Service Manual

Caller ID Compatible

KX-TG8200BXB
KX-TGA820BXB

Digital Cordless Phone
Black Version
(for Middle Near East and Africa)

KX-TGA820BXB
(HANDSET)

KX-TG8200BXB
(BASE UNIT)

(CHARGER UNIT)

Configuration for each model

Model No	Base Unit	Handset	Charger Unit	Expandable
KX-TG8200	1 (TG8200)	1 (TGA820)		Up to 6
KX-TGA820*		1 (TGA820)	1	

* KX-TGA820 is also an optional accessory, which contains a handset and a charger.

Panasonic

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING

If lead free solder was used in the manufacture of this product, the printed circuit boards will be marked PbF. Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark. When this mark does appear, please read and follow the special instructions described in this manual on the use of PbF and how it might be permissible to use Pb solder during service and repair work.

- When you note the serial number, write down all 11 digits. The serial number may be found on the bottom of the unit.
- The illustrations in this Service Manual may vary slightly from the actual product.

Note for TABLE OF CONTENTS:
Because sections 5, 6 and 7 of this manual are extract from the operating instructions for this model, they are subject to change without notice. You can download and refer to the original operating instructions on TSN Server for further information.

TABLE OF CONTENTS

1 Safety Precautions

1.1. For Service Technicians

- **Repair service shall be provided in accordance with repair technology information such as service manual so as to prevent fires, injury or electric shock, which can be caused by improper repair work**.
  1. When repair services are provided, neither the products nor their parts or members shall be remodeled.
  2. If a lead wire assembly is supplied as a repair part, the leadwire assembly shall be replaced.
  3. FASTON terminals shall be plugged straight in and unplugged straight out.

- **ICs and LSIs are vulnerable to static electricity.**
  When repairing, the following precautions will help prevent recurring malfunctions.
  1. Cover plastic parts boxes with aluminum foil.
  2. Ground the soldering irons.
  3. Use a conductive mat on worktable.
  4. Do not grasp IC or LSI pins with bare fingers.

2 Warning

2.1. Battery Caution

1. Danger of explosion if battery is incorrectly replaced.
2. Replace only with the same or equivalent type recommended by the manufacturer.
3. Dispose of used batteries according to the manufacture's Instructions.

2.2. About Lead Free Solder (Pbf: Pb free)

Note:
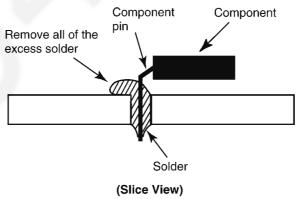
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

We will use PbF solder when discussing the lead free solder used in our manufacturing process which is made from Tin (Sn), Silver (Ag), and Copper (Cu).

This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB. For service and repair work we suggest using the same type of solder.
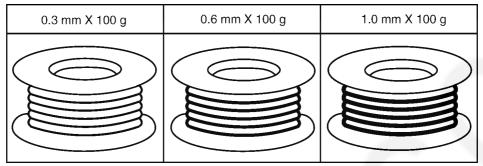
Caution

- PbF solder has a melting point that is 50 °F ~ 70 °F (30 °C ~ 40 °C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700 °F ± 20 °F (370 °C ± 10 °C).
- Exercise care while using higher temperature soldering irons.:
  Do not heat the PCB for too long time in order to prevent solder splash or damage to the PCB.
- PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100 °F (600 °C).
- When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See the figure below).

(Slice View)

2.2.1. Suggested PbF Solder

There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper (Sn+Ag+Cu), you can also use Tin and Copper (Sn+Cu) or Tin, Zinc, and Bismuth (Sn+Zn+Bi). Please check the manufacturer's specific instructions for the melting points of their products and any precautions for using their product with other materials.
The following lead free (PbF) solder wire sizes are recommended for service of this product: 0.3 mm, 0.6 mm and 1.0 mm.

0.3 mm X 100 g	0.6 mm X 100 g	1.0 mm X 100 g

2.3. Discarding of P. C. Board

When discarding P. C. Board, delete all personal information such as telephone directory and caller list or scrap P. C. Board.

3 Specifications

■ **Standard:**
DECT (Digital Enhanced Cordless Telecommunications),
GAP (Generic Access Profile)

■ **Number of channels:**
120 Duplex Channels

■ **Frequency range:**
1.88 GHz to 1.90 GHz

■ **Duplex procedure:**
TDMA (Time Division Multiple Access)

■ **Channel spacing:**
1,728 kHz

■ **Bit rate:**
1,152 kbit/s

■ **Modulation:**
GFSK (Gaussian Frequency Shift Keying)

■ **RF transmission power:**
Approx. 250 mW

■ **Voice coding:**
ADPCM 32 kbit/s

■ **Power source (AC Adaptor):**
220–240V, 50/60Hz
Base unit: PQLV207BXZ
Charger: PQLV209BXZ

■ **Power consumption**
Base unit:
Standby: Approx. 2.1 W
Maximum: Approx. 5.9 W
Charger:
Standby: Approx. 1.0 W
Maximum: Approx. 5.4 W

■ **Operating conditions:**
5 °C–40 °C, 20 %–80 % relative air humidity (dry)

■ **Dimensions:**
Base unit: Approx. 44 mm x 116 mm x 113 mm
Handset: Approx. 143 mm x 47 mm x 32 mm
Charger: Approx. 46 mm x 77 mm x 87 mm

■ **Mass (weight):**
Base unit: Approx. 170 g
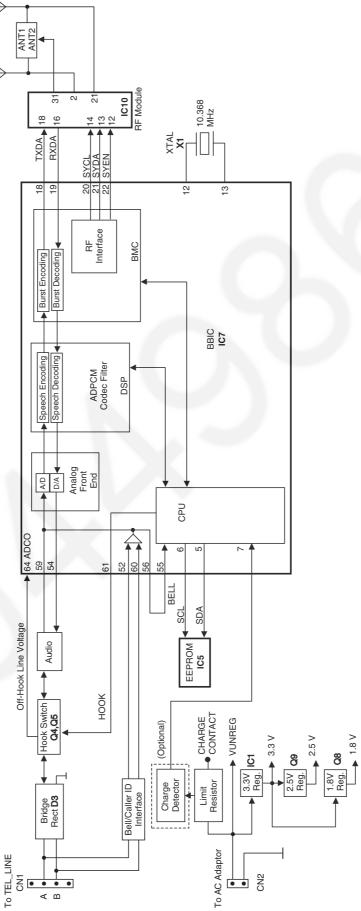**Handset:** Approx. 120 g
Charger: Approx. 70 g

Note:
• Specifications are subject to change.

Note for Service:
• **Operation range:** Up to 300 m outdoors, Up to 50 m indoors, depending on the condition.
• **Analog telephone connection:** Telephone Line

4 Technical Descriptions

4.1. Block Diagram (Base Unit)

KX-TG8200 BLOCK DIAGRAM (BASE UNIT)

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4.2. Circuit Operation (Base Unit)

4.2.1. Outline

Base Unit consists of the following ICs as shown in **Block Diagram (Base Unit)** (P.7).

- DECT BBIC (**B**ase **B**and IC): IC7
    - Handling all the audio, signal and data processing needed in a DECT base unit
    - Controlling the DECT specific physical layer and radio section (**B**urst **M**odule **C**ontroller section)
    - ADPCM code filter for speech encoding and speech decoding (DSP section)
    - Echo-cancellation and Echo-suppression (DSP section)
    - Any tones (tone, sidetone, ringing tone, etc.) generation (DSP section)
    - DTMF receiver (DSP section)
    - Clock Generation for RF Module
    - ADC, DAC, timer, and power control circuitry
    - All interfaces (ex: RF module, EEPROM, LED, Analog Front End, etc.)
- RF Module: IC10
    - PLL Oscillator
    - Detector
    - Compress/Expander
    - First Mixer
    - Amplifier for transmission and reception
- EEPROM: IC5
    - Temporary operating parameters (for RF, etc.)
- Additionally,
    - Power Supply Circuit (+3.3 V, +2.5 V, +1.8 V output)
    - Crystal Circuit (10.368 MHz)
    - Charge Circuit
    - Telephone Line Interface Circuit

4.2.2. Power Supply Circuit

The power is supplied to the DECT BBIC, RF Module, EEPROM and Charge Contact from AC Adaptor (+6.5 V) as shown in Fig.101. The power supply is as follows;

• DECT BBIC (IC7):
  CN2 (+6.5 V) → IC1 → Q9 → IC7
  CN2 (+6.5 V) → IC1 → Q8 → IC7
• RF Module (IC10):
  CN2 (+6.5 V) → IC1 → Q8 → IC10 (Radio Transceiver) (Digital)
  CN2 (+6.5 V) → IC1 → Q9 → IC10 (Radio Transceiver) (Analog)
  CN2 (+6.5 V) → IC1 → R125 → IC10 (Power AMP)
• EEPROM (IC5):
  CN2 (+6.5 V) → IC1 → Q9 → IC5
• Charge Contact (TP16):
  CN2 (+6.5 V) → R57 → R56 → R55 → D22 → TP16
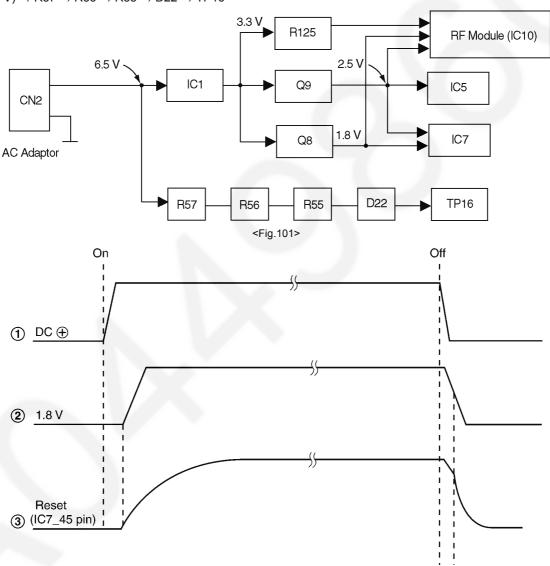
<Fig.101>

9

4.2.3. Telephone Line Interface

<Function>
• Bell signal detection
• Clip signal detection
• ON/OFF hook circuit

Bell & Clip (: Calling Line Identification Presentation: Caller ID) signal detection:

In the standby mode, Q3 is open to cut the DC loop current and decrease the ring load.

When ring voltage appears at the L1T (A) and L1R (B) leads (when the telephone rings), the AC ring voltage is transferred as follows;

• A → C4 → R6 → R33 → IC7 Pin 60 (CID INp)
• B → C3 → R4 → R35 → IC7 Pin 52 (CID INn)

ON/OFF hook circuit:

In the standby mode, Q3 is open, and connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an **on-hook condition**.

When IC7 detects a ring signal or press the TALK Key onto the handset, Q4 turns on and then Q3 turns on, thus providing an **off-hook condition** (DC current flows through the circuit) and the following signal flow makes the loop current.

• A → D3 → Q3 → Q5 → R21 → R22 → D3 → B [**OFF HOOK**]

4.2.4. Transmitter/Receiver

• Audio Circuits and DTMF tone signal circuits.

Base unit and handset mainly consist of RF Module and DECT BBIC.

Base unit and handset transmit/receive voice signal and data signal through the antenna on carrier frequency.

Signal Path:

*Refer to **Signal Route** (P.14).

4.2.4.1. Transmitter Block

The voice signal input from the TEL LINE interface goes to RF Module (IC10) through DECT BBIC (IC7) as shown in **Block Diagram (Base Unit)** (P.7)

The voice signal passes through the analog part of IC7 where it is amplified and converted to a digital audio stream signal. The burst switch controller processes this stream performing encryption and scrambling, adding the various other fields to produce the GAP (**G**eneric **A**ccess **P**rofile) standard DECT frame, assigning to a time slot and channel etc.

In IC10, the carrier frequency is changing, and frequency modulated RF signal is generated and amplified, and radiated from antenna. Handset detects the voice signal or data signal in the circuit same as the following explanation of Receiver Block.

4.2.4.2. Receiver Block
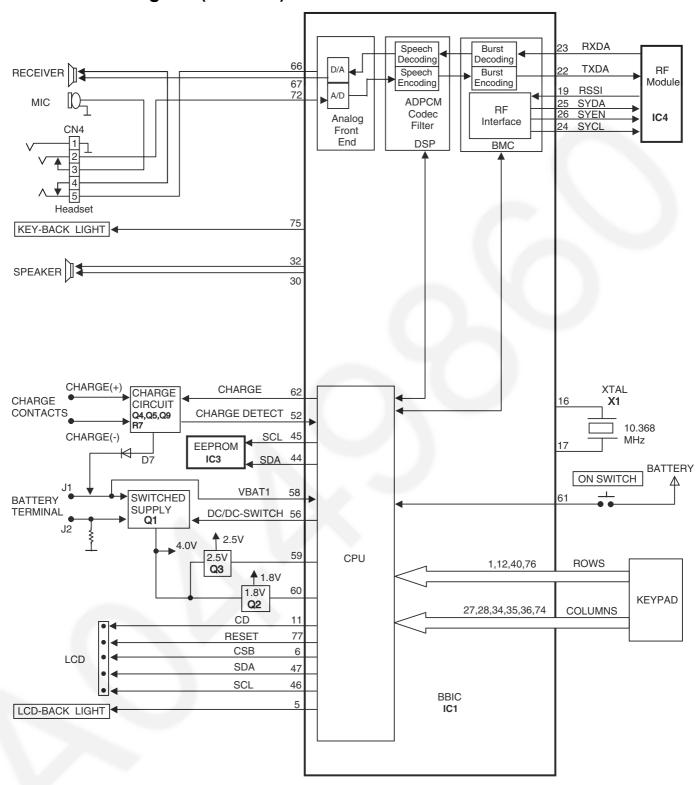
The signal of 1900 MHz band (1881.792 MHz ~ 1897.344 MHz) which is input from antenna is input to IC10 as shown in **Block Diagram (Base Unit)** (P.7).

In IC10, the signal of 1900 MHz band is downconverted to 864 kHz signal and demodulated, and goes to IC7 as GAP (**G**eneric **A**ccess **P**rofile) standard DECT frames. It passes through the decoding section burst switch controller where it separates out the frame information and performs de-encryption and de-scrambling as required. It then goes to the DSP section where it is turned back into analog audio. This is amplified by the analog front end, and goes to the TEL LINE Interface.

4.2.5. Pulse Dialling

During pulse dialing the hookswitch (Q3, Q4) is used to generate the pulses using the HOOK control signal, which is set high during pulses. To force the line impedance low during the "pause" intervals between dial pulses, the PULSE_DIAL signal turns on Q2.

4.3. Block Diagram (Handset)

KX-TGA820 BLOCK DIAGRAM (HANDSET)

4.4. Circuit Operation (Handset)

4.4.1. Outline

Handset consists of the following ICs as shown in **Block Diagram (Handset)** (P.11).

- DECT BBIC (**B**ase **B**and IC): IC1
    - All data signals (forming/analyzing ACK or CMD signal)
    - All interfaces (ex: Key, Detector Circuit, Charge, DC/DC Converter, EEPROM, LCD)
- RF Module: IC4
    - PLL Oscillator
    - Detector
    - Compress/Expander
    - Amplifier for transmission and reception
- EEPROM: IC3
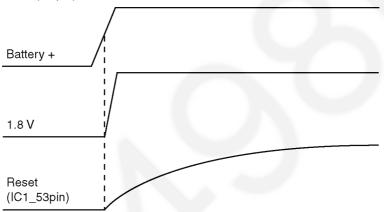   - Temporary operating parameters (for RF, etc.)

4.4.2. Power Supply Circuit/Reset Circuit

Circuit Operation:

When power on the handset, the voltage is as follows;

BATTERY(2.2 V ~ 2.6 V: J1) → F1, L1, D1 → Q2 (1.8 V), Q3 (2.5 V), Q1 (3.3 V)

The Reset signal generates IC1 (53 pin) and 1.8 V.

4.4.3. Charge Circuit

Circuit Operation:

When charging the handset on the base unit, the charge current is as follows;

DC+(6.5 V) → R57 → R56 → R55 → D22 → CHARGE+(Base) → CHARGE+(Handset) → L4 → Q4 → D7→ F1 → BATTERY+... Battery... BATTERY- → R45 → GND → L5 → CHARGE-(Handset)→ CHARGE-(Base) → GND → DC-(GND)

In this way, the BBIC on handset detects the fact that the battery is charged.

The charge current is controlled by switching Q5 of handset.

Refer to Fig.101 in **Power Supply Circuit** (P.9).

4.4.4. Battery Low/Power Down Detector

Circuit Operation:

"Battery Low" and "Power Down" are detected by BBIC which checks the voltage from battery.

The detected voltage is as follows;

- Battery Low

Battery voltage: V(Batt) ≦ 2.25 V ± 50 mV

The BBIC detects this level and "📧" starts flashing.

- Power Down

Battery voltage: V(Batt) ≦ 2.0 V ± 50 mV

The BBIC detects this level and power down.
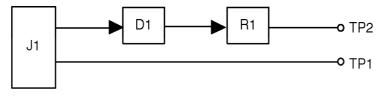
4.4.5. Speakerphone

The hands-free loudspeaker at SP+ and SP- is used to generate the ring alarm.

4.5.   Circuit Operation (Charger Unit)
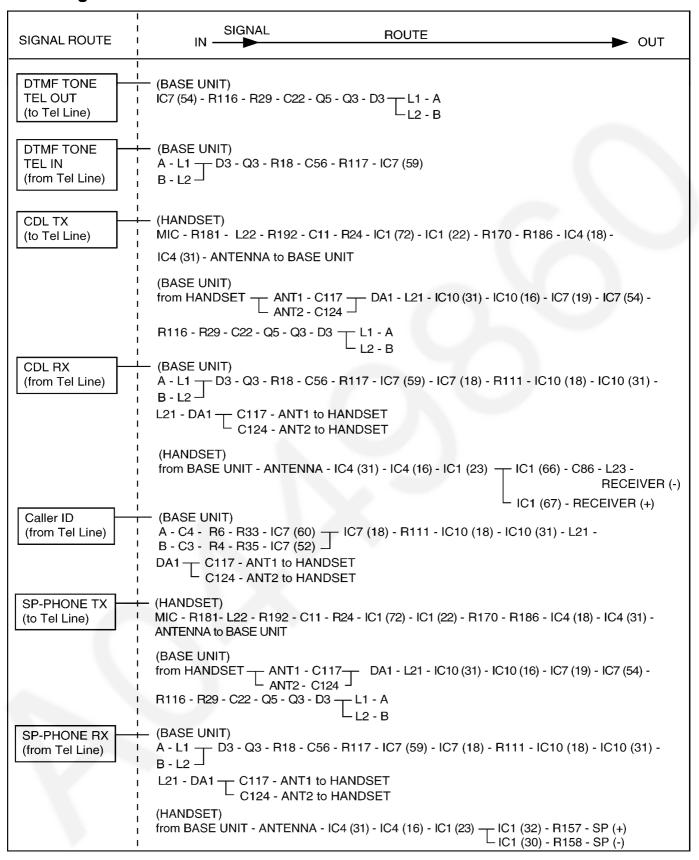
4.5.1.   Power Supply Circuit

The power supply is as shown.

```
  ┌──────┐           ┌──────┐      ┌──────┐
  │      │──────────▶│  D1  │─────▶│  R1  │──────o TP2
  │  J1  │           └──────┘      └──────┘
  │      │──────────────────────────────────────o TP1
  └──────┘
```

AC Adaptor

4.6. Signal Route

SIGNAL ROUTE	SIGNAL ROUTE
	IN ⟶ SIGNAL ROUTE ⟶ OUT

DTMF TONE TEL OUT (to Tel Line)

(BASE UNIT)
IC7 (54) - R116 - R29 - C22 - Q5 - Q3 - D3 ⎯ L1 - A
⎯ L2 - B

DTMF TONE TEL IN (from Tel Line)

(BASE UNIT)
A - L1 ⎯ D3 - Q3 - R18 - C56 - R117 - IC7 (59)
B - L2 ⎯

CDL TX (to Tel Line)

(HANDSET)
MIC - R181 - L22 - R192 - C11 - R24 - IC1 (72) - IC1 (22) - R170 - R186 - IC4 (18) -

IC4 (31) - ANTENNA to BASE UNIT

(BASE UNIT)
from HANDSET ⎯ ANT1 - C117 ⎯ DA1 - L21 - IC10 (31) - IC10 (16) - IC7 (19) - IC7 (54) -
⎯ ANT2 - C124 ⎯

R116 - R29 - C22 - Q5 - Q3 - D3 ⎯ L1 - A
⎯ L2 - B

CDL RX (from Tel Line)

(BASE UNIT)
A - L1 ⎯ D3 - Q3 - R18 - C56 - R117 - IC7 (59) - IC7 (18) - R111 - IC10 (18) - IC10 (31) -
B - L2 ⎯

L21 - DA1 ⎯ C117 - ANT1 to HANDSET
⎯ C124 - ANT2 to HANDSET

(HANDSET)
from BASE UNIT - ANTENNA - IC4 (31) - IC4 (16) - IC1 (23) ⎯ IC1 (66) - C86 - L23 -
⎯ RECEIVER (-)
⎯ IC1 (67) - RECEIVER (+)

Caller ID (from Tel Line)

(BASE UNIT)
A - C4 - R6 - R33 - IC7 (60) ⎯ IC7 (18) - R111 - IC10 (18) - IC10 (31) - L21 -
B - C3 - R4 - R35 - IC7 (52) ⎯

DA1 ⎯ C117 - ANT1 to HANDSET
⎯ C124 - ANT2 to HANDSET

SP-PHONE TX (to Tel Line)

(HANDSET)
MIC - R181- L22 - R192 - C11 - R24 - IC1 (72) - IC1 (22) - R170 - R186 - IC4 (18) - IC4 (31) -
ANTENNA to BASE UNIT

(BASE UNIT)
from HANDSET ⎯ ANT1 - C117 ⎯ DA1 - L21 - IC10 (31) - IC10 (16) - IC7 (19) - IC7 (54) -
⎯ ANT2 - C124 ⎯

R116 - R29 - C22 - Q5 - Q3 - D3 ⎯ L1 - A
⎯ L2 - B

SP-PHONE RX (from Tel Line)

(BASE UNIT)
A - L1 ⎯ D3 - Q3 - R18 - C56 - R117 - IC7 (59) - IC7 (18) - R111 - IC10 (18) - IC10 (31) -
B - L2 ⎯

L21 - DA1 ⎯ C117 - ANT1 to HANDSET
⎯ C124 - ANT2 to HANDSET

(HANDSET)
from BASE UNIT - ANTENNA - IC4 (31) - IC4 (16) - IC1 (23) ⎯ IC1 (32) - R157 - SP (+)
⎯ IC1 (30) - R158 - SP (-)

5 Location of Controls and Components

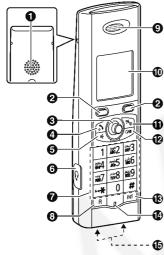## 5.1. Controls

5.1.1. Base Unit
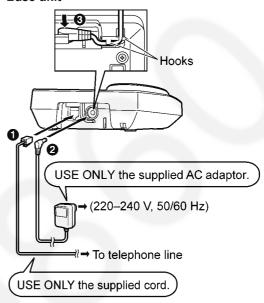

❶ Charge contacts
❷ [•))] (Page)

5.1.2. Handset

❶ Speaker
❷ Soft keys
❸ Joystick
❹ [➚] (Talk)
❺ [◁×] (Speakerphone)
❻ Headset jack
❼ Dial keypad
❽ [R] (Flash)
❾ Receiver
❿ Display
⓫ [✂①] (Off/Power)
⓬ [C/⊠] (Clear/Mute)
⓭ [INT] (Intercom)
⓮ Microphone
⓯ Charge contacts

6 Installation Instructions

6.1. Connections

Connect the telephone line cord until it clicks into the base unit and telephone line jack (❶). Connect the AC adaptor cord (❷) by pressing the plug firmly (❸).
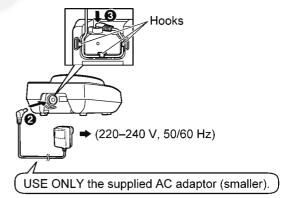
Base unit

Hooks

USE ONLY the supplied AC adaptor.

→ (220–240 V, 50/60 Hz)

→ To telephone line

USE ONLY the supplied cord.

Important:
● If you use a telephone line cord which is not supplied, the unit may not work properly.

Charger

Hooks

→ (220–240 V, 50/60 Hz)

USE ONLY the supplied AC adaptor (smaller).

Note:
● Never install telephone wiring during a lightning storm.
● The AC adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)
● The AC adaptor should be connected to a vertically oriented or floor-mounted AC outlet. Do not connect the AC adaptor to a ceiling-mounted AC outlet, as the weight of the adaptor may cause it to become disconnected.
● The unit will not work during a power failure.
We recommend connecting a corded telephone to the same telephone line or to the same telephone jack using a T-adaptor.
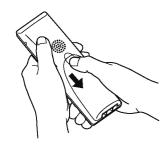
Location
● For maximum distance and noise-free operation, place your base unit:
  – away from electrical appliances such as TVs, radios, personal computers, or other phones.
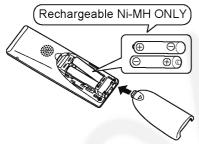 – in a convenient, high, and central location.

6.2. Battery

6.2.1. Battery Installation and Replacement

Important:

● Use only the supplied rechargeable batteries HHR-4EPT.
● USE ONLY rechargeable Ni-MH batteries AAA (R03) size.
● Do NOT use Alkaline/Manganese/Ni-Cd batteries.
● Ensure correct polarities ($\oplus$, $\ominus$) when installing the batteries.
● Wipe the battery ends ($\oplus$, $\ominus$) with a dry cloth.
● When installing the batteries, avoid touching the battery ends ($\oplus$, $\ominus$) or the unit contacts.
● When replacing batteries, we recommend using the Panasonic rechargeable batteries P03P.

1 Press the notch on the handset cover firmly and slide it in the direction of the arrow.

2 Insert the batteries negative ($\ominus$) end first. Close the handset cover.

Rechargeable Ni-MH ONLY

Note:

● When replacing batteries, remove the old batteries.
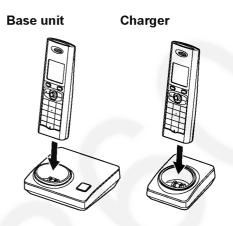
See **For Service Hint** (P.23)

6.2.2. Battery Charge

Place the handset on the base unit or charger for about 7 hours before initial use.
When charging, "Charging" will be displayed.
When the batteries are fully charged, "Charge Completed" will be displayed.

Base unit   Charger

Note:
• It is normal for the handset to feel warm during charging.
• If you want to use the unit immediately, charge the batteries for at least 15 minutes.
• Clean the charge contacts of the handset, base unit, and charger with a soft, dry cloth. Clean if the unit is subject to the exposure of grease, dust or high humidity.

6.2.3. Battery Level

Battery icon	Battery level
	High
	Medium
	Low ● When flashing: Needs to be charged.

6.2.4. Panasonic Ni-MH Battery Performance (supplied batteries)

Operation	Operating time
In continuous use	12 hours max.
In continuous standby mode	150 hours max.

Note:
• It is normal for batteries not to reach full capacity at the initial charge. Maximum battery performance is reached after a few complete cycles of charge/discharge (use).
• Actual battery performance depends on a combination of how often the handset is in use and how often it is not in use (standby).
• Even after the handset is fully charged, the handset can be left on the base unit or charger without any ill effect on the batteries.
• The battery level may not be displayed correctly after you replace the batteries. In this case, place the handset on the base unit or charger and let it charge for at least 7 hours.

7 Operation Instructions

7.1.   Base Unit Settings

To customise the base unit using the handset:

1   ⊞ (centre of joystick)

2   Select   by pushing the joystick in any direction. ⟶ **OK**

3   Push the joystick up or down to select the desired item in the base unit settings menu. ⟶ **OK**

4   Push the joystick up or down to select the desired item in the sub-menu. ⟶ **OK**

5   Push the joystick up or down to select the desired setting then press **OK**.
   ●This step may vary depending on the feature being programmed.
   ●To exit the operation, press 【✂◎】.

Note:
●The current item or setting is highlighted on the display.

Menu	Sub-menu	Details (default setting)	Remarks (selectable options)
Call Options	Dial Mode	("Tone")	Tone/Pulse
	Recall/Flash	Flash time ("600 msec.").[*2]	80/90/100/110/160/200/250/ 300/400/600/700/900 msec
	Area Code	—	Up to 1 number (5 digits)
	Call Restrict	—	Off/On (Up to 6 Numbers)
Other Options	Base Unit PIN	Change base unit PIN ("0000").[*3] – Enter the current 4-digit base unit PIN.[*4] – Enter the new 4-digit base unit PIN. ⟶ **OK** ⟶ 【✂◎】	"0000" - "9999" (4 digits)
	Repeater Mode [*1]	("Off")	On/Off

*1 The item will not be reset when pressing 1, 5, 9 and ✳ key of the handset. Refer to **How to Clear User Setting** (P.30).

*2 Change the recall time, if necessary, depending on the requirements of your service provider/telephone company or PBX.

*3 If you change the PIN, please make note of your new PIN. The unit will not reveal the PIN to you.

*4 If you forget your PIN, see **For Service Hint** (P.23).

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7.2. Handset Settings

To customise the handset:

1 ⊞ (centre of joystick)

2 Select ▮ by pushing the joystick in any direction. → **OK**

3 Push the joystick up or down to select the desired item in the handset settings menu. → **OK**

4 Push the joystick up or down to select the desired item in the sub-menu. → **OK**
   - In some cases, you may need to select from a second sub-menu. → **OK**

5 Push the joystick up or down to select the desired setting then press **OK**.
   - This step may vary depending on the feature being programmed.
   - To exit the operation, press **[✂⊙]**.

Note:
- The current item or setting is highlighted on the display.

Menu	Sub-menu	Sub-menu 2 Details (default setting)	Remarks (selectable options)
Time Settings	Set Date & Time[*1,*2]	—	—
	Alarm	—	Off/Once/Daily
Ringer Setup	Ringer Volume	For handset *(Maximum)*[*3]	Off/Volume 1 to 6[*7]
	Ext. Ringtone *(External ringtone)*	For outside calls ("Ringtone 1")[*4,*5]	20 (6 tone + 14 melody)
	Night Mode	Start/End *(23:00/06:00)*	—
		On/Off ("Off")	On/Off
		Ring Delay ("60 sec.")	30/60/90/120 sec and No Ringing
		Select Category	Category 1 to 9
Display Setup	Wallpaper	("Wallpaper1")	Off/Wallpaper 1 to 3
	Display Colour	("Colour1")	Colour 1 to 5
	Standby Display	("Off")[*6]	Off/Handset Number/Base Number
	Select Language	("English")	4 languages selectable
	Contrast	("Contrast 3")	Contrast 1 to 6
Registration[*1]	Register H.set *(Register handset)*	See "**Registering a Handset to a Base Unit**".	—
Select Base	—	("Auto")	Auto/Base 1 to Base 4[*8]
Other Options	Keytones	("On")	On/Off
	Auto Talk	("Off")	On/Off

*1 The item will not be reset when pressing [1], [5], [9] and [✕] keys. Refer to **How to Clear User Setting** (P.30).

*2 The item will not be reset when pressing [3], [5], [7] and [#] keys. Refer to **How to Clear User Setting** (P.30).

*3 When the ringer volume is turned off, ⊄ is displayed and the handset does not ring for outside calls.
   However even when the ringer volume is turned off, the handset rings:
   – at the minimum level for alarm and intercom calls
   – at the maximum level for paging

*4 If you select one of the melody ringtones, the ringtone will continue to sound for several seconds if the caller hangs up before you answer. You may hear a dial tone or no one on the line when you answer a call.

*5 The preset melodies in this product are used with permission of © 2006 Copyrights Vision Inc.

*6 "Off": Displays the current date and time only.
   "Handset Number": Displays the handset number such as "[1]".
   "Base Number": Displays the base unit number such as "-1-".

*7 The items are not shown on the display.

*8 Here, only the case that a handset is registered to a maximum of 4 Base units is mentioned.

Cross Reference:
   Registering a Handset to a Base Unit (P.19)

7.3.   Registering a Handset to a Base Unit

The supplied handset and base unit are pre-registered. When you purchase an additional handset, refer to the additional handset's installation manual for registration. If for some reason the handset is not registered to the base unit (for example, ⅄ flashes even when the handset is near the base unit), register the handset.

1 🖵 (centre of joystick) ⟶ 📱 ⟶ **OK**
2 [▲]/[▼]: "Registration" ⟶ **OK**
3 [▲]/[▼]: "Register H.set" ⟶ **OK**
4 [▲]/[▼]: Select a base unit number. ⟶ **OK**
   ● This number is used by the handset as a reference only.
5 Press and hold [⋅))] on the base unit for about 5 seconds. (No registration tone)
   ● If all registered handsets start ringing, press [⋅))] to stop, then repeat this step.
   ● After pressing [⋅))], the rest of this procedure must be completed within 90 seconds.
6 Wait until "Enter Base PIN" is displayed. ⟶ Enter the base unit PIN (default: "0000"). ⟶ **OK**

   ● If you forget your PIN, see **For Service Hint** (P.23).

   ● When the handset has been registered successfully, ⅄ will stop flashing. If the key tone is turned on, a confirmation tone will be heard.

7.3.1.   Deregistering a handset

A handset can cancel its own registration (or the registration of another handset) that is stored in the base unit. This will allow the base unit to "forget" the handset.

1 🖵 (centre of joystick) ⟶ 📟 ⟶ **OK**
2 Enter "335".
3 [▲]/[▼]: "Deregistration" ⟶ **OK**
   ● The numbers of all handsets registered to the base unit are displayed.
4 Select the handset(s) you want to cancel, by pressing the desired handset number. ⟶ **OK**
   ● The selected handset number(s) will flash.
   ● To cancel a selected handset number, press the number again. The number will stop flashing.
5 [▲]/[▼]: "Yes" ⟶ **OK**
   ● A long beep will sound as each handset number disappears.
   ● The handset does not beep when cancelling its own registration.
6 [✂☉]

7.3.2.   Cancelling a base unit

A handset can cancel a base unit that it is registered to. This allows the handset to "forget" the base unit.

1 🖵 (centre of joystick) ⟶ 📱 ⟶ **OK**
2 [▲]/[▼]: "Registration" ⟶ **OK**
3 Enter "335".
4 [▲]/[▼]: "Cancel Base" ⟶ **OK**
5 Select the base unit(s) you want to cancel, by pressing the desired base unit number. ⟶ **OK**
   ● The selected base unit number(s) will flash.
   ● To cancel a selected base unit number, press the number again. The number will stop flashing.
6 [▲]/[▼]: "Yes" ⟶ **OK** ⟶ [✂☉]

Note:
● To register the handset to another base unit or to the same base unit again, see **Registering a Handset to a Base Unit**.

Cross Reference:

7.4.   Copying Phonebook Entries

You can copy handset phonebook entries to the handset phonebook of another compatible Panasonic handset.

Note:
 • Category settings for phonebook entries are not copied

7.4.1.   Copying all entries

1 📖 (left soft key) ⟶ 🔳
2 [▲]/[▼]: "Copy All" ⟶ **OK**
3 Enter the handset number you wish to send the handset phonebook entry to.
   •When all entries have been copied, "Completed" is displayed.
4 【✕①】

7.5.   Dialling Mode (Tone/Pulse)

Change the dialling mode depending on your telephone line service.
"Tone": Select when you have a touch-tone service.
"Pulse": Select when you have rotary/pulse service.

1 🔳 (centre of joystick)
2 Select 🖇 by pushing the joystick in any direction. ⟶ **OK**
3 Push the joystick up or down to select "Call Options". ⟶ **OK**
4 Push the joystick up or down to select "Dial Mode". ⟶ **OK**
5 Push the joystick up or down to select the desired setting. ⟶ **OK** ⟶ 【✕①】

7.6.   Error Message

Error message	Cause & solution
Failed	• Phonebook copy failed. Confirm the other handset (the receiver) is in standby mode and try again.
Incomplete	• The receiver's phonebook memory is full. Erase the unnecessary phonebook entries from the other handset (the receiver) and try again.
Memory Full	• The handset's phonebook memory is full. Erase unnecessary entries.
No link to base. Move closer to base, try again.	• The handset has lost communication with the base unit. Move closer to the base unit and try again. • Unplug the base unit's AC adaptor to reset the unit. Reconnect the adaptor and try again. • The handset's registration may have been cancelled. Re-register the handset.
You must first subscribe to Caller ID.	• You must subscribe to Caller ID service. Once you receive caller information after subscribing to Caller ID service, this message will not be displayed.

7.7. Troubleshooting

If you still have difficulties after following the instructions in this section, disconnect the base unit AC adaptor and turn off the handset, then reconnect the base unit AC adaptor and turn on the handset.

Telephone

Problem	Cause & solution
Ⴠ is flashing.	● The handset is not registered to the base unit. Register it. ● The handset is too far from the base unit. Move closer. ● The base unit AC adaptor is not connected. Check the connections. ● You are using the handset or base unit in an area with high electrical interference. Place the handset and base unit away from interference sources, such as antennas and mobile phones.
The handset display is blank.	● The handset is in screen saver mode. Press 【✒①】 to activate the handset display again. ● The handset is not turned on. Turn the power on.
The handset will not turn on.	● Make sure that the batteries are installed correctly. ● Fully charge the batteries. ● Clean the charge contacts and charge again.
I have changed the display language to a language I cannot read.	● Change the display language.
I cannot make or receive calls.	● The base unit AC adaptor or telephone line cord is not connected. Check the connections. ● If you are using a splitter to connect the unit, remove the splitter and connect the unit to the wall socket directly. If the unit operates properly, check the splitter. ● Disconnect the base unit from the telephone line and connect the line to a known working telephone. If the working telephone operates properly, contact our service personnel to have the unit repaired. If the working telephone does not operate properly, contact your service provider/telephone company. ● The dialling mode setting is incorrect. Set to "**Tone**" or "**Pulse**" as needed. ● You dialled a call restricted number. ● The key lock feature is turned on. Turn it off.
The unit does not ring.	● The ringer volume is turned off. Adjust the ringer volume. ● The night mode feature is turned on. Turn it off.
The batteries should be charging but the battery icon does not change.	● Clean the charge contacts and charge again.
A busy tone is heard when 【↰】 is pressed.	● The handset is too far from the base unit. Move closer and try again. ● Another handset is in use. Wait and try again later.
Static is heard, sound cuts in and out. Interference from other electrical units.	● Place the handset and the base unit away from other electrical appliances. ● Move closer to the base unit. ● Your unit is connected to a telephone line with DSL service.
Noise is heard during a call.	● You are using the handset or base unit in an area with high electrical interference. Place the handset and base unit away from interference sources, such as antennas and mobile phones.

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Problem	Cause & solution
The handset/base unit stops working while being used.	● Disconnect the base unit AC adaptor and turn off the handset. Connect the base unit AC adaptor, turn on the handset and try again.
The handset beeps intermittently and/or flashes.	● Fully charge the batteries.
I fully charged the batteries, but still flashes.	● Clean the charge contacts and charge again. ● It is time to replace the batteries.
I fully charged the batteries, but the operating time seems to be short.	● Wipe the battery ends ($\oplus$, $\ominus$) and the unit contacts with a dry cloth.
Caller information is not displayed.	● You need to subscribe to Caller ID service. Consult your service provider/telephone company for details. ● Your unit is connected to a telephone line with DSL service.
I cannot register a handset to a base unit.	● The maximum number of base units (4) are already registered to the handset. Cancel unused base unit registrations from the handset. ● The maximum number of handsets (6) are already registered to the base unit. Cancel unused handset registrations from the base unit. ● You entered the wrong PIN. If you forget your PIN, see **"For Service Hint"**. ● Place the handset and the base unit away from other electrical appliances.
The handset phonebook entries I copied are not displayed correctly.	● Undisplayable characters are replaced with spaces for entries copied from/to additional handsets other than KX-TGA820BX.
I do not know how to erase ➔) (Missed call) from the display.	● There are unviewed missed calls remaining. View them using the following method. 1 ▦ (centre of joystick) → ➔) → **OK** 2 Push the joystick down to search from the most recent call, or push the joystick up to search from the oldest call.

For DSL users

We recommend connecting a filter (contact your DSL service provider) to the telephone line between the base unit and the telephone line jack.

Cross Reference:

7.8. For Service Hint

Items	Contents
Battery	You could use other rechargeable batteries sold in a market, but the unit is not guaranteed to work properly.
	The battery strength may not be indicated correctly if the battery is disconnected and connected again, even after it is fully charged. In that case, by recharging the battery as mentioned in **Battery Charge**, you will get a correct indication of the battery strength.
PIN Code	● Change the PIN using the following method. 　1　▦ (centre of joystick) 　2　Select ▦ by pushing the joystick in any direction. → **OK** 　3　[▲]/[▼]: "Other Options" → **OK** 　4　[▲]/[▼]: "Base Unit PIN" → **OK** 　5　[✱][7][0][0][0] 　6　Enter the new 4-digit base unit PIN. → **OK** → [✂①]

Cross Reference:
　Battery Charge (P.16)
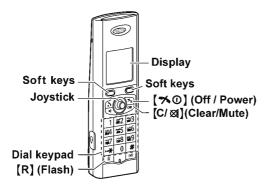
8   Service Mode

8.1.   Engineering Mode

8.1.1.   Base Unit

Important:
  Make sure the address on LCD is correct when entering new data. Otherwise, you may ruin the unit.

H/S key operation   **H/S LCD**

1).   Register a Handset to a Base Unit. (*1)

2).   Press "⊞" (centre of joystick), then
      select "▱" by pushing the joystick.

      Base Unit Setup

3).   Press "OK" (centre of joystick).

      Call Options
      Other Options

4).   Enter "7", "2", "6", "2", "7", "6", "6", "4".
      Note: 7262 7664 = PANA SONI
              (see letters printed on dial keys)

      Engineering Mode
      Read EEPROM
      Write EEPROM
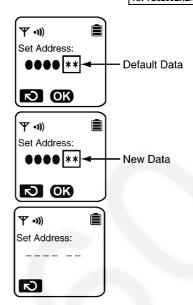
5).   Select "Write EEPROM" by pushing the
      joystick.

      Engineering Mode
      Read EEPROM
      Write EEPROM

6).   Press "OK" (centre of joystick).

      Set Address:
      _ _ _ _ _ _

7). Enter "●", "●", "●", "●" (Address). (*2)

Set Address:

●●●● |**| ← Default Data

↩ OK

8). Enter "*", "*" (New Data). (*2)

Set Address:

●●●● |**| ← New Data

↩ OK

9). Press " OK " (centre of joystick).

A long confirmation beep will be heard.

Set Address:

_ _ _ _ _ _

↩

10). Press "📵" (off) to return to standby mode.

After that, turn the base unit power off and then power on.

Frequently Used Items (Base Unit)

ex.)

| Items	Address	Default Data	New Data		Remarks
C-ID (FSK) sensitivity	04 C3	00	01 (6 dB up)	02 (12 dB up)	When hex changes from "00" to "01" or "02", gain increases by 6 dB or 12 dB.
C-ID (DTMF) sensitivity	04 D1	50	60 (6 dB up)	70 (12 dB up)	When hex changes from "50" to "60" or "70", gain increases by 6 dB or 12 dB.
Frequency	00 01	75	-	-	Use these items in a **READ-ONLY** mode to confirm the contents. Careless rewriting may cause serious damage to the computer system.
ID	00 10~00 14	Given value	-	-	
Bell length	01 F5	64 (10 sec) (*3)	1E (3 sec)	14 (2 sec)	This is time until bell stops ringing. (Unit: 100 ms)
PULSE Dial speed (10PPS -> 20PPS)	03 A5	28 (40 msec) (*3)	14 (20 msec)	-	This is pulse make time. (Unit: 1 ms)
	03 A6	3C (60 msec) (*3)	1E (30 msec)	-	This is pulse break time. (Unit: 1 ms)
	01 E4	57 (870 msec) (*3)	2C (440 msec)	-	This is inter-digit time in pulse mode. (Unit: 10 ms)

Note:

(*1) Refer to **Registering a Handset to a Base Unit** (P.19)

(*2) When you enter the address or New Data, please refer to the table below.

Desired Number (hex)	Input Keys	Desired Number (hex)	Input Keys
0	0	A	[R] + 0
1	1	B	[R] + 1
.	.	C	[R] + 2
.	.	D	[R] + 3
.	.	E	[R] + 4
9	9	F	[R] + 5
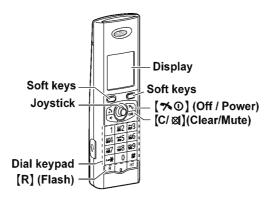
(*3)

Bell length	64 (hex) = 100 (dec) → 100 × 100 msec = 10000 msec (10sec)
PULSE Dial speed (10PPS -> 20PPS)	28 (hex) = 40 (dec) → 40 × 1msec = 40 msec
	3C (hex) = 60 (dec) → 60 × 1 msec = 60 msec
	57 (hex) = 87 (dec) → 87 × 10 msec = 870 msec

8.1.2. Handset

Important:
Make sure the address on LCD is correct when entering new data. Otherwise, you may ruin the unit.

H/S key operation

H/S LCD

1). Press "▦" (centre of joystick), then select "▯" by pushing the joystick.

Handset Setup

2). Press "OK" (centre of joystick).

Time Settings
Ringer Setup
Display Setup

3). Enter "7", "2", "6", "2", "7", "6", "6", "4".
   Note: 7262 7664 = PANA SONI
   (see letters printed on dial keys)

Engineering Mode
Read EEPROM
Write EEPROM

4). Select "Write EEPROM" by pushig the joystick.

Engineering Mode
Read EEPROM
Write EEPROM

5). Press "OK" (centre of joystick).

Set Address:
_ _ _ _ _ _

6). Enter "●", "●", "●", "●" (Address). (*1)

Set Address:
●●●● ** ← Default Data

7). Enter "∗", "∗" (New Data). (*1)

Set Address:

●●●● ∗∗ ← New Data
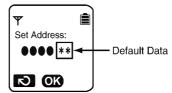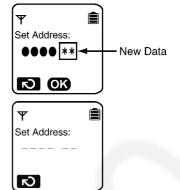
8). Press "OK" (centre of joystick).
A long confirmation beep will be heard.

Set Address:

_ _ _ _ _ _

9). Press "✆" (off) to return to standby mode.
After that, remove and reinsert the batteries.
Press the Power button for about 1 second
if the power is not turned on.

Frequently Used Items (Handset)
ex.)

Items	Address	Default Data	New Data	Possible Adjusted Value MAX (hex)	Possible Adjusted Value MIN (hex)	Remarks
Sending level	00 06	Adjusted value	Given value	6F	00	(*2)
Receiving level	00 07	Adjusted value	Given value	00	3F	(*3)
Battery Low	00 04	25	-	-	-	(*4)
Frequency	00 01	75	-	-	-	
ID	00 10~00 14	Given value	-	-	-	

Note:
(*1) When you enter the address or New Data, please refer to the table below.

Desired Number (hex.)	Input Keys	Desired Number (hex.)	Input Keys
0	0	A	[R] + 0
1	1	B	[R] + 1
.	.	C	[R] + 2
.	.	D	[R] + 3
.	.	E	[R] + 4
9	9	F	[R] + 5

(*2) When adding "01" (hex) to default value, sending level increases by 0.25 dB.
ex.)

Item	Default Data	New Data	
	3A	3E	36
Sending level	-8.5 dBm	-7.5 dBm	-9.5 dBm

(*3) When reducing "01" (hex) from default value, receiving level increases by 0.25 dB.
ex.)
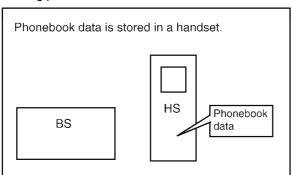
Item	Default Data	New Data	
	14	18	10
Receiving level	-21 dBm	-22 dBm	-20 dBm

(*4) Use these items in a READ-ONLY mode to confirm the contents. Careless rewriting may cause serious damage to the handset.
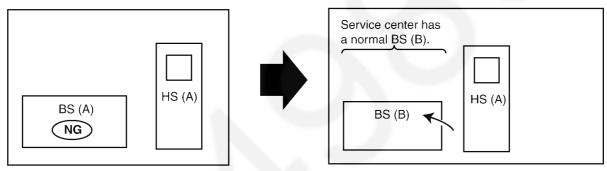
8.2. Copying Phonebook Items when Repairing

You can copy the handset phonebook to another (compatible Panasonic) handset. This will help to save the original phonebook data which the customer has registered.

Available models: KX-TG8200

Refer to the following procedures.

Phonebook data is stored in a handset.

BS

HS

Phonebook data
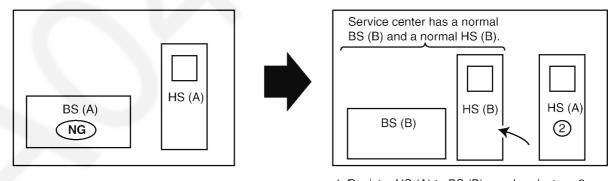
Case 1: A base unit has a defect.
(Replacing a base unit PCB etc...)

BS (A)
NG

HS (A)

Service center has a normal BS (B).

BS (B)

HS (A)

1. Register HS (A) to BS (B).
   HS (A) is normal, therefore no need to copy the phonebook data.

Case 2: A base unit has a defect.
(Replacing both a base unit and a handset)

BS (A)
NG

HS (A)

Service center has a normal BS (B) and a normal HS (B).

BS (B)

HS (B)

HS (A)
②
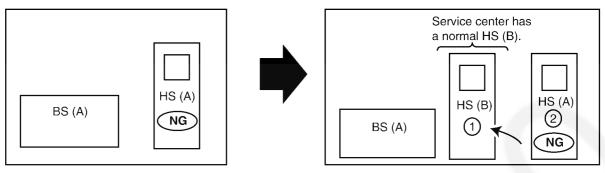
1. Register HS (A) to BS (B) as a handset no. 2.
2. Copy the phonebook data from HS (A) to HS (B).
3. Cancel the HS 2 (HS (A)).

Note:
• BS=Base Unit , HS=Handset
• If the max number of handsets are already registered to the base unit, a new handset cannot be registered.
• To register the handset, refer to **Registering a Handset to a Base Unit** (P.19)
• To cancel the handset, refer to **Deregistering a handset** (P.19)
• To copy the handset phonebook, refer to **Copying Phonebook Entries** (P.20)
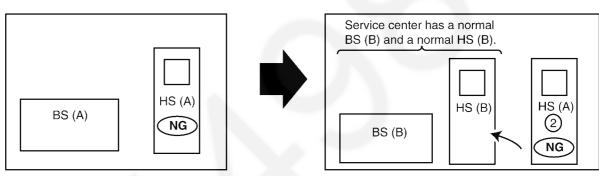
Case 3: A handset has a defect.
(Radio transmission is functioning.)

Service center has a normal HS (B).

1. Cancel HS (A).
2. Register HS (B) as a handset no. 1.
3. Register HS (A) as a handset no. 2.
4. Copy the phonebook data from HS (A) to HS (B).
5. Cancel HS 2 (HS (A)).

Case 4: A handset has a defect.
(Radio transmission is functioning.)

Service center has a normal BS (B) and a normal HS (B).

1. Register HS (A) as a handset no. 2.
2. Copy the phonebook data from HS (A) to HS (B).
3. Cancel HS 2 (HS (A)).

Note:
• BS=Base Unit , HS=Handset
• If the max number of handsets are already registered to the base unit, a new handset cannot be registered.
• To register the handset, refer to **Registering a Handset to a Base Unit** (P.19)
• To cancel the handset, refer to **Deregistering a handset** (P.19)
• To copy the handset phonebook, refer to **Copying Phonebook Entries** (P.20)

8.3. How to Clear User Setting
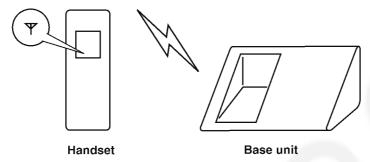
Units are reset to the Factory settings by this operation (Erase stored Phone numbers, Caller list and etc.)

Note:
- Some menus are not reset. Refer to **Operation Instructions** (P.17).
- The reset menus differ depending on the following operations.
- **This operation should not be performed for a usual repair.**

8.3.1. Resetting both base unit and handset

Both the base unit and the registered handset which you did the following steps ① to ④ are reset. Other registered handsets will not be reset.

Handset   **Base unit**

① Connect the AC adaptor to the base unit and install the charged batteries into the handset.

② Confirm the handset is registered to the base unit (lights).
   If the handset is not registered to the base unit (is flashing), register it. (*1)
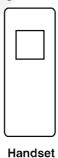
③ Lift the handset and press 【✆①】 to put the handset in standby mode.

④ Press ①, ⑤, ⑨ and ⊞ key of the handset simultaneously until a confirmation tone is heard.

⑤ Disconnect the AC adaptor, then remove the battery.

Note:
(*1) Refer to **Registering a Handset to a Base Unit** (P.19).

8.3.2. Resetting only handset

The only handset is reset by doing the following steps ① to ④.

Handset

① Install the charged batteries into the handset.

② Lift the handset and press 【✆①】 to put the handset in standby mode.

③ Press ③, ⑤, ⑦ and ⊞ key of the handset simultaneously until a confirmation tone is heard. (*2)

④ Remove the battery.
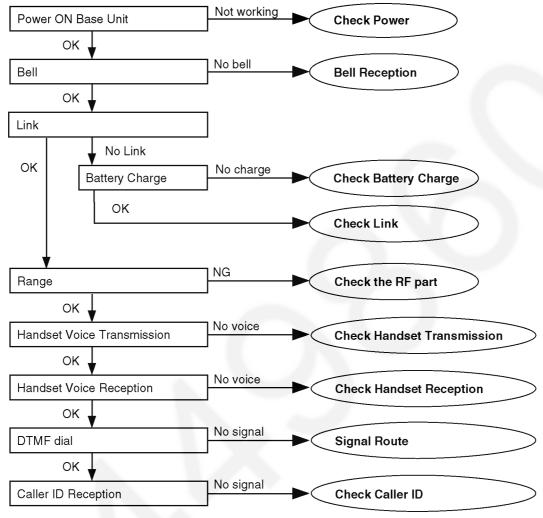
Note: (*2)
- The handset registration to the base unit is cancelled.
- If the handset needs to be registered to the base unit, refer to **Registering a Handset to a Base Unit** (P.19).
- If users do not bring the base unit with them, the registration procedure has to be done by users themselves.

9 Troubleshooting Guide

9.1. Troubleshooting Flowchart

Flow Chart

```
Power ON Base Unit ──Not working──▶ ( Check Power )
        │ OK
        ▼
      Bell ──No bell──▶ ( Bell Reception )
        │ OK
        ▼
      Link
        │ OK            ──No Link──▶ Battery Charge ──No charge──▶ ( Check Battery Charge )
        │                               │ OK
        │                               └──────────────────────▶ ( Check Link )
        ▼
     Range ──NG──▶ ( Check the RF part )
        │ OK
        ▼
Handset Voice Transmission ──No voice──▶ ( Check Handset Transmission )
        │ OK
        ▼
Handset Voice Reception ──No voice──▶ ( Check Handset Reception )
        │ OK
        ▼
    DTMF dial ──No signal──▶ ( Signal Route )
        │ OK
        ▼
Caller ID Reception ──No signal──▶ ( Check Caller ID )
```

Cross Reference:

Check Power (P.32)
Bell Reception (P.42)
Check Battery Charge (P.33)
Check Link (P.34)
Check the RF part (P.38)
Check Handset Transmission (P.41)
Check Handset Reception (P.41)
Signal Route (P.14)
Check Caller ID (P.41)
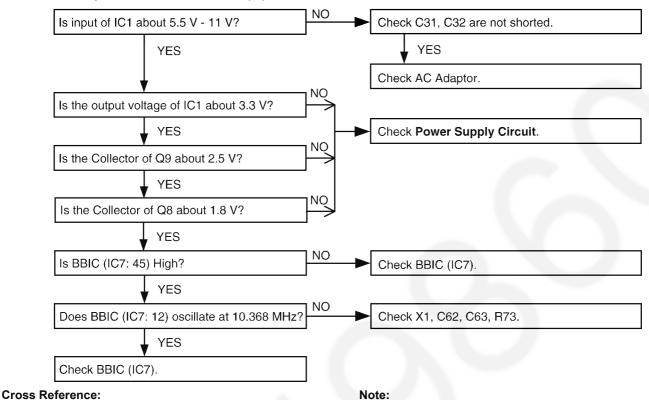
9.1.1. Check Power

9.1.1.1. Base Unit

Is the AC Adaptor inserted into AC outlet? (*1)

```
Is input of IC1 about 5.5 V - 11 V?  ──NO──▶  Check C31, C32 are not shorted.
            │                                              │
           YES                                            YES
            │                                              ▼
            ▼                                   Check AC Adaptor.
Is the output voltage of IC1 about 3.3 V?  ──NO──┐
            │                                     │
           YES                                    ▼
            ▼                              Check Power Supply Circuit.
Is the Collector of Q9 about 2.5 V?  ──NO──┘
            │
           YES
            ▼
Is the Collector of Q8 about 1.8 V?  ──NO──┘
            │
           YES
            ▼
Is BBIC (IC7: 45) High?  ──NO──▶  Check BBIC (IC7).
            │
           YES
            ▼
Does BBIC (IC7: 12) oscillate at 10.368 MHz?  ──NO──▶  Check X1, C62, C63, R73.
            │
           YES
            ▼
Check BBIC (IC7).
```

Cross Reference:
   Power Supply Circuit (P.9)

Note:
(*1) Refer to **Specifications** (P.6) for part number and
supply voltage of AC Adaptor.

9.1.1.2. Handset

```
Is the battery inserted to J1 (BATT+) and J2 (BATT-)?
            │
           YES
            ▼
Is the voltage of J1 (BATT) 2.3 V more?  ──NO──▶  Check the battery and around J1 and J2
            │                                      are not shorted.
           YES
            ▼
Is the voltage of VDD3 about 4.0 V?  ──NO──┐
            │                               │
           YES                              ▼
            ▼                        Check Power Supply Circuit/Reset Circuit.
Is the voltage of VDD2 about 2.5 V?  ──NO──┤
            │                               │
           YES                              │
            ▼                               │
Is the voltage of VDD1 about 1.8 V?  ──NO──┘
            │
           YES
            ▼
Does BBIC (IC1: 16) oscillate at 10.368 MHz?  ──NO──▶  Check X1, C6, C7.
            │
           YES
            ▼
Check BBIC (IC1).
```
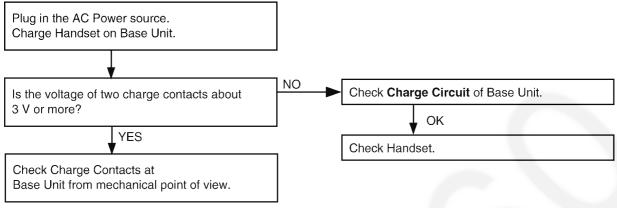
Cross Reference:
   Power Supply Circuit/Reset Circuit (P.12)

9.1.2. Check Battery Charge

9.1.2.1. Base Unit

```
┌─────────────────────────────────────┐
│ Plug in the AC Power source.         │
│ Charge Handset on Base Unit.         │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐   NO    ┌──────────────────────────────────────┐
│ Is the voltage of two charge contacts│────────▶│ Check Charge Circuit of Base Unit.   │
│ about 3 V or more?                   │         └──────────────────────────────────────┘
└─────────────────────────────────────┘                          │ OK
                  │ YES                                           ▼
                  ▼                              ┌──────────────────────────────────────┐
┌─────────────────────────────────────┐         │ Check Handset.                       │
│ Check Charge Contacts at             │         └──────────────────────────────────────┘
│ Base Unit from mechanical point of view.│
└─────────────────────────────────────┘
```
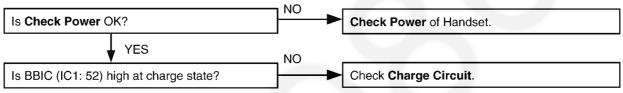
Cross Reference:
  Charge Circuit (P.12)

9.1.2.2. Handset

```
┌─────────────────────────────────────┐   NO    ┌──────────────────────────────────────┐
│ Is Check Power OK?                   │────────▶│ Check Power of Handset.              │
└─────────────────────────────────────┘         └──────────────────────────────────────┘
                  │ YES
                  ▼
┌─────────────────────────────────────┐   NO    ┌──────────────────────────────────────┐
│ Is BBIC (IC1: 52) high at charge state?│──────▶│ Check Charge Circuit.                │
└─────────────────────────────────────┘         └──────────────────────────────────────┘
```

Cross Reference:
  Check Power (P.32)
  Charge Circuit (P.12)

9.1.2.3. Charger Unit

```
┌─────────────────────────────────────┐
│ Plug in the AC Power source.         │
│ Charge Handset on Charger Unit.      │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐   NO    ┌──────────────────────────────────────┐
│ Is the voltage of two charge contacts│────────▶│ Check Charge Circuit of Charger Unit.│
│ about 3 V or more?                   │         └──────────────────────────────────────┘
└─────────────────────────────────────┘                          │ OK
                  │ YES                                           ▼
                  ▼                              ┌──────────────────────────────────────┐
┌─────────────────────────────────────┐         │ Check Handset.                       │
│ Check Charge Contacts at Charger Unit│         └──────────────────────────────────────┘
│ from mechanical point of view.       │
└─────────────────────────────────────┘
```

Cross Reference:
  Charge Circuit (P.12)

9.1.3. Check Link

9.1.3.1. Base Unit

```
Does Base Unit make link with normal working   --YES-->   Base Unit is OK. Check Handset.
Handset?
   |
   NO
   v
Is the voltage of VDD3 about 3.3 V?   --NO-->   Check around Power Supply Circuit.
Refer to Check Point...(A).
   |
   YES
   v
Is the voltage of VDD2 about 2.5 V?   --NO-->
Refer to Check Point...(B).
   |
   YES
   v
Is the voltage of VDD1 about 1.8 V?   --NO-->   Adjust VDD1 voltage to 1.8 V.
   |                                               Refer to Check Point...(C).
   YES                                               |
   |                                                OK
   v
Does the RF clock (CLK) oscillate at 10.368 MHz in   --NO-->   Check around X1 and RF module and adjust
Base Unit Test Mode?                                            clock frequency.
Refer to Check Point...(F).                                     Refer to Check Point...(F).
   |
   YES
   v
Is there CMD60/CTS60 (: DECT60 Tester)?   --NO (*1)-->
   |
   YES
   v
Does Base Unit make link with CMD60/CTS60 in   --NO-->
Base Unit Test Mode?
Refer to Check Point...(I).
   |
   YES
   v
Is the NTP value OK?   --NO-->   Replace with a new Circuit Board.
Refer to Check Point...(I).
   |
   YES
   v
Is the modulation OK?   --NO-->
Refer to Check Point...(J).
   |
   YES
   v
Is the Frequency Offset OK?   --NO-->
Refer to Check Point...(K).
   |
   YES
   v
⋮ Continued to the next page.
```

Note:
   (*1) Refer to **Troubleshooting by Symptom (Base Unit and Charger Unit)** (P.43)
Cross Reference:
   Check Point (Base Unit) (P.43)
   Power Supply Circuit (P.9)

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⋮

YES

┌───┐
│ Is the Frequency Drift OK?   │ NO
│ Refer to **Check Point**...**(L)**.   │ ──→
└───┘

YES

┌───┐
│ Is the Sensitivity Receiver OK?   │ NO
│ Refer to **Check Point**...**(M)**.   │ ──→
└───┘

YES

┌───┐   ┌──────────────────────────────────────┐
│ Is the Timing OK?   │ NO   │ Replace with a new Circuit Board.   │
│ Refer to **Check Point**...**(N)**.   │ ──→ ───────────→ │   │
└───┘   └──────────────────────────────────────┘

YES

┌───┐
│ Is the Power RAMP OK?   │ NO
│ Refer to **Check Point**...**(O)**.   │ ──→
└───┘

Cross Reference:
   Check Point (Base Unit) (P.43)

9.1.3.2. Handset

```
┌─────────────────────────────────────┐  YES   ┌─────────────────────────────────────┐
│ Does Handset make link with Base Unit?├──────▶│ Handset is OK. Check Base Unit.     │
│ (Correct working unit)              │        └─────────────────────────────────────┘
└─────────────────────────────────────┘
                │ NO
                ▼
┌─────────────────────────────────────┐  NO    ┌─────────────────────────────────────┐
│ Is the voltage of VDD1 about 1.8 V? ├──────▶│ Adjust C10 voltage to 1.8 V.        │
│ Refer to Check Point...(A).         │        │ Refer to Check Point...(A).         │
└─────────────────────────────────────┘        └─────────────────────────────────────┘
        │ YES                              OK │              NO │
        ▼                                     │                 │
┌─────────────────────────────────────┐  NO    ┌─────────────────────────────────────┐
│ Is the voltage of VDD3 about 4.0 V? ├──────▶│ Check around Power Supply Circuit/Reset Circuit. │
│ Refer to Check Point...(B).         │        └─────────────────────────────────────┘
└─────────────────────────────────────┘
        │ YES                              NO
        ▼
┌─────────────────────────────────────┐
│ Is the voltage of VDD2 about 2.5 V? │
│ Refer to Check Point...(C).         │
└─────────────────────────────────────┘
        │ YES
        ▼
┌─────────────────────────────────────┐  NO    ┌─────────────────────────────────────┐
│ Does the RF clock (CLK) oscillate:  ├──────▶│ Check around X1 and RF module and adjust │
│ 10.368 MHz in Handset Test Mode?    │        │ clock frequency.                    │
│ Refer to Check Point...(J).         │        │ Refer to Check Point...(J).         │
└─────────────────────────────────────┘        └─────────────────────────────────────┘
        │ YES
        ▼
┌─────────────────────────────────────┐  NO (*1)
│ Is there CMD60/CTS60 (: DECT60 Tester)?├──────▶
└─────────────────────────────────────┘
        │ YES
        ▼
┌─────────────────────────────────────┐  NO
│ Does Handset make link with CMD60/CTS60├──────▶
│ in Handset Test Mode?               │
│ Refer to Check Point...(K).         │
└─────────────────────────────────────┘
        │ YES
        ▼
┌─────────────────────────────────────┐  NO    ┌─────────────────────────────────────┐
│ Is the NTP value OK?                ├──────▶│ Replace with a new Circuit Board.   │
│ Refer to Check Point...(K).         │        └─────────────────────────────────────┘
└─────────────────────────────────────┘
        │ YES
        ▼
┌─────────────────────────────────────┐  NO
│ Is the modulation OK?               ├──────▶
│ Refer to Check Point...(L).         │
└─────────────────────────────────────┘
        │ YES
        ▼
┌─────────────────────────────────────┐  NO
│ Is the Frequency Offset OK?         ├──────▶
│ Refer to Check Point...(M).         │
└─────────────────────────────────────┘
        │ YES
        ▼
   Continued to the next page.
```

Cross Reference:
　　Check Point (Handset) (P.46)
　　Power Supply Circuit/Reset Circuit (P.12)

⋮

YES

Is the Frequency Drift OK?
Refer to **Check Point**...**(N)**.

NO

YES

Is the Sensitivity Receiver OK?
Refer to **Check Point**...**(O)**.

NO

YES

Is the Power RAMP OK?
Refer to **Check Point**...**(P)**.

NO

Replace with a new Circuit Board.

Cross Reference:
    Check Point (Handset) (P.46)
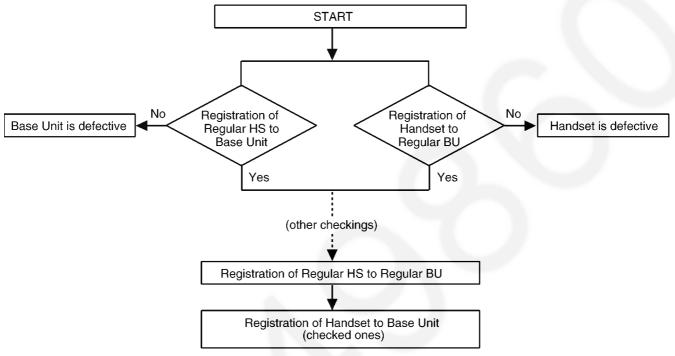
9.1.4.   Check the RF part

9.1.4.1.   Finding out the Defective part

1. Prepare Regular HS (Handset) and Regular BU (Base unit).
2. a. Re-register regular HS (Normal mode) to Base Unit (to be checked).
     If this operation fails in some ways, the Base Unit is defective.
   b. Re-register Handset (to be checked) to regular BU (Normal mode).
     If this operation fails in some ways, the Handset is defective.

After All the Checkings or Repairing
1. Re-register the checked Handset to the checked Base Unit, and Regular HS to Regular BU.

```
                            ┌──────────────────────┐
                            │         START        │
                            └──────────┬───────────┘
                                       │
                                       ▼
┌───────────────────┐   No  ╱ Registration of ╲   ╱ Registration of ╲   No  ┌───────────────────┐
│ Base Unit is      │◄──────  Regular HS to        Handset to         ──────►│ Handset is        │
│ defective         │        ╲ Base Unit     ╱   ╲ Regular BU    ╱          │ defective         │
└───────────────────┘          Yes               Yes                        └───────────────────┘
                                       │
                                (other checkings)
                                       ▼
                      ┌──────────────────────────────────────┐
                      │ Registration of Regular HS to Regular BU │
                      └───────────────────┬──────────────────┘
                                          ▼
                      ┌──────────────────────────────────────┐
                      │ Registration of Handset to Base Unit    │
                      │           (checked ones)               │
                      └──────────────────────────────────────┘
```
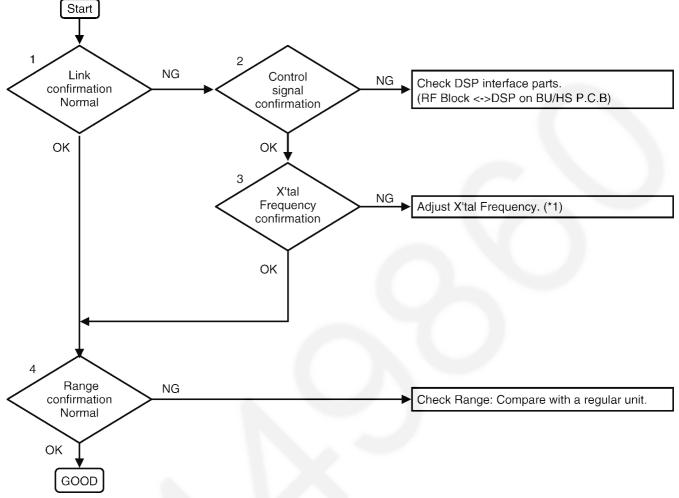
Note:
If you need to register a handset, refer to **Registering a Handset to a Base Unit** (P.19)

9.1.4.2. RF Check Flowchart

Each item (1 ~ 4) of RF Check Flowchart corresponds to **Check Table for RF part** (P.40).
Please refer to the each item.

```
                    ┌─────────┐
                    │  Start  │
                    └─────────┘
                         │
                         ▼
    1                              2
   ╱╲ Link            NG          ╱╲ Control          NG      ┌────────────────────────────────┐
  ╱  ╲ confirmation ────────────►╱  ╲ signal      ──────────► │ Check DSP interface parts.     │
  ╲  ╱ Normal                    ╲  ╱ confirmation            │ (RF Block <->DSP on BU/HS P.C.B)│
   ╲╱                             ╲╱                          └────────────────────────────────┘
    │ OK                           │ OK
    │                              ▼
    │                      3
    │                     ╱╲ X'tal           NG      ┌────────────────────────────────┐
    │                    ╱  ╲ Frequency  ──────────► │ Adjust X'tal Frequency. (*1)   │
    │                    ╲  ╱ confirmation           └────────────────────────────────┘
    │                     ╲╱
    │                      │ OK
    │◄─────────────────────┘
    ▼
    4
   ╱╲ Range             NG      ┌──────────────────────────────────────┐
  ╱  ╲ confirmation ──────────► │ Check Range: Compare with a regular unit. │
  ╲  ╱ Normal                   └──────────────────────────────────────┘
   ╲╱
    │ OK
    ▼
┌────────┐
│  GOOD  │
└────────┘
```

Note:

(*1) Base unit - refer to (F) of **Check Point (Base Unit)** (P.43)

  Handset - refer to (J) of **Check Point (Handset)** (P.46)

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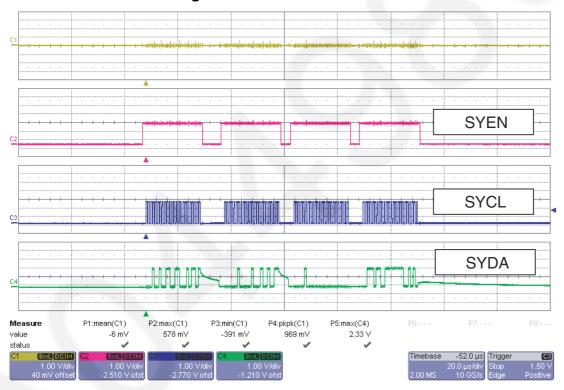
9.1.4.3. Check Table for RF part

No.	Item	BU (Base Unit) Check	HS (Handset) Check
1	Link Confirmation Normal	1. Register Regular HS to BU (to be checked). (*1) 2. Press [Talk] key of the Regular HS to establish link.	1. Register HS (to be checked) to Regular BU. (*1) 2. Press [Talk] key of the HS to establish link.
2	Control signal confirmation	1. Check BBIC interface. (*2)	1. Check BBIC interface. (*2)
3	X'tal Frequency confirmation	1. Check X'tal Frequency. (*3) (10.368 MHz ± 100 Hz)	1. Check X'tal Frequency. (*4) (10.368 MHz ±100 Hz)
4	Range Confirmation Normal	1. Register Regular HS to BU (to be checked). (*1) 2. Press [Talk] key of the Regular HS to establish link. 3. Compare the range of the BU (being checked) with that of the Regular BU.	1. Register HS (to be checked) to Regular BU. 2. Press [Talk] key of the HS to establish link. 3. Compare the range of the HS (being checked) with that of the Regular HS.

Note:

(*1) Refer to **Registering a Handset to a Base Unit** (P.19)

(*2) Refer to **RF-BBIC Interface Signal Wave Form** (P.40)

(*3) Refer to **Adjustment Standard (Base Unit)** (P.60)

(*4) Refer to **Adjustment Standard (Handset)** (P.64)

9.1.4.4. RF-BBIC Interface Signal Wave Form

9.1.5.   Check Handset Transmission

Check MIC of Handset.

↓ OK

Check CDL TX (HANDSET) in **Signal Route**.

Cross Reference:
  Signal Route (P.14)

9.1.6.   Check Handset Reception

Check Handset Speaker in **How to check the Handset Speaker or Receiver**.

↓ OK

Check CDL RX (HANDSET) in **Signal Route**.

Cross Reference:
  How to Check the Handset Speaker or Receiver (P.68).
  Signal Route (P.14)

9.1.7.   Check Caller ID
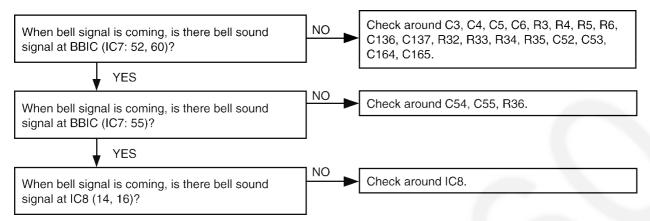
Check Caller ID in **Signal Route**.

Cross Reference:
  Signal Route (P.14)
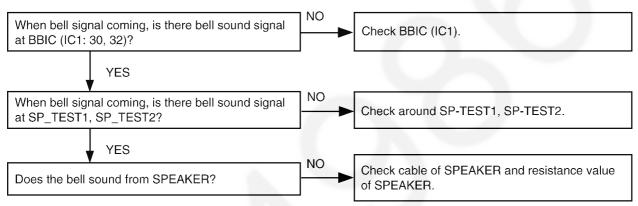
9.1.8. Bell Reception

9.1.8.1. Base Unit

| When bell signal is coming, is there bell sound signal at BBIC (IC7: 52, 60)? | NO → | Check around C3, C4, C5, C6, R3, R4, R5, R6, C136, C137, R32, R33, R34, R35, C52, C53, C164, C165. |

↓ YES

| When bell signal is coming, is there bell sound signal at BBIC (IC7: 55)? | NO → | Check around C54, C55, R36. |

↓ YES

| When bell signal is coming, is there bell sound signal at IC8 (14, 16)? | NO → | Check around IC8. |

9.1.8.2. Handset

| When bell signal coming, is there bell sound signal at BBIC (IC1: 30, 32)? | NO → | Check BBIC (IC1). |

↓ YES

| When bell signal coming, is there bell sound signal at SP_TEST1, SP_TEST2? | NO → | Check around SP-TEST1, SP-TEST2. |

↓ YES

| Does the bell sound from SPEAKER? | NO → | Check cable of SPEAKER and resistance value of SPEAKER. |

Cross Reference:
   Telephone Line Interface (P.10)
   Check Link (P.34)
   How to Check the Handset Speaker or Receiver (P.68)

9.2. Troubleshooting by Symptom (Base Unit and Charger Unit)

If your unit has below symptoms, follow the instructions in remedy column. Remedies depend on whether you have DECT tester (*1) or not.

Symptom	Remedy (*2)	
	You don't have DECT Tester.	You have DECT Tester. (Model Number : CMD60)
You cannot dial.	Check item (**A**)-(**H**).	Check item (**A**)-(**H**), (**I**)-(**O**).
You cannot hear the caller's voice.	Check item (**A**)-(**F**).	Check item (**A**)-(**F**), (**I**)-(**O**), (**P**).
You cannot use handset a little away from base unit even if the handset is within range of the base unit.	-	Check item (**I**)-(**O**).
The acoustic transmit level is high or low.	Check item (**P**).	Check item (**P**).
The acoustic reception level is high or low.	Check item (**P**).	Check item (**P**).
Base unit and handset do not link each other.	Check item (**A**)-(**H**).	Check item (**A**)-(**O**).
The unit cannot charge.	Check item (**Q**).	Check item (**Q**).

Note:

(*1) A general repair is possible even if you don't have the DECT tester because it is for confirming the levels, such as Acoustic level in detail.

(*2) Refer to **Check Point (Base Unit)** (P.43)

9.2.1. Check Point (Base Unit)

Please follow the items below when BBIC or EEPROM is replaced.

Note:

After the measuring, suck up the solder of TP.

*: **PC Setting** (P.58) is required beforehand.

The connections of simulator equipments are as shown in **Adjustment Standard (Base Unit)** (P.60).

	Items	Check Point	Procedure	Check or Replace Parts
(**A**)	3.3 V Supply Confirmation	VDD3	1. Confirm that the voltage between test point VDD3 and GND is 3.3 V ± 0.2 V.	IC1, C31, C32, R38, R39, C36, C37
(**B**)	2.5 V Supply Confirmation	VDD2	1. Confirm that the voltage between test point VDD2 and GND is 2.5 V ± 0.2 V.	Q9, C70, C71
(**C**)	1.8 V Supply Confirmation	VDD1	1. Confirm that the voltage between test point VDD1 and GND is 1.8 V ± 0.1 V.	Q8, R72, D12, C64, C68
(**D**)*	BBIC Confirmation	-	1. BBIC Confirmation (Execute the command "getchk"). 2. Confirm the returned checksum value. Connection of checksum value and program number is shown below. ex.) | checksum value | program number | / | A55E | DAB1ZA |	IC7, R73, C62, C63, X1, C72, R75~R81, R62, R63
(**E**)*	EEPROM Confirmation	-	1. EEP-ROM Confirmation (Execute the command "ChkTG8200XXrevYY.bat"). XX: country code YY: revision number 2. Confirm the returned checksum value. 3. The checksum is displayed in the last output line. **Note:** "XX", "YY", and "checksum" vary depending on the country version. You can find them in the batch file, PQZZ- mentioned in **JIG and PC** (P.58).	IC5, C51, R62, R63, C50, Q25, R134, R141, C160
(**F**)*	BBIC Clock Adjustment	CLK	1. Check X'tal Frequency. (10.368 MHz ± 100 Hz). Input Command "rdeeprom 00 01 01", then you can confirm the current value. 2. If the frequency is not 10.368 MHz ± 100Hz, Adjust the frequency of CLK executing the command "setfreq xx (where xx is the value)" so that the reading of the frequency counter is 10.368000 MHz ± 20 Hz.	IC10, C111, C112, X1, R73, C62, C63

	Items	Check Point	Procedure	Check or Replace Parts
(G)*	Hookswitch Check with DC Characteristics	-	1. Connect CN1 (Telephone Socket) to Tel-simulator which is connected with 600 Ω. 2. Set line voltage to 48 V and line current to 40 mA at off-hook condition of normal telephone. 3. Execute the command "hookoff" 4. Confirm that the line current is 40 mA ± 5 mA. 5. Execute the command "hookon". 6. Confirm that the line current is less than + 0.8 mA.	L1, L2, Q3, R14, R15, Q4, R16, R17, IC7, D3
(H)	DTMF Generator Check	-	1. Connect CN1 (Telephone Socket) to DTMF tester. (Road=600 Ω) 2. Link Handset and push dial key. 3. Confirm DTMF character. 4. Confirm that the high Group is -6 dBm ± 2 dBm. 5. Confirm that the low Group is -8 dBm ± 2 dBm.	IC7, R116, C141, R29, C22, C23, R18~R24, C14~C17, Q5, D4

(I)*	Transmitted Power Confirmation	-	Remove the Antenna before starting step from 1 to 7.
			1. Configure the DECT tester (CMD60) as follows;
			  <Setting>
			  • Short A_1 and GND.
			  • Test mode: FP
			  • Traffic Carrier: 5
			  • Traffic Slot: 4
			  • Mode: Loopback
			  • PMID: 00000
			  • RF LEVEL = -70dBm.
			2. Execute the command "testmode".
			3. Execute the command "sendchar dmv 2 2".
			4. Check that "Signalling Status" has been set to "Locked", then press "ACCEPT RFPI".
			5. Initiate connection from Dect tester ("set up connect")
			6. Execute the command "ANT1".
			7. Confirm that the NTP value at ANT is 20.7 dBm ~ 25.7 dBm.
				IC7, IC10, L7, C117, C118, C124, C125, R106, R109, DA1, C112, R111, C126, C127, R112, R125, C128

(J)*	Modulation Check and Adjustment	-	Follow steps 1 to 6 of (I). 7.Confirm that the B-Field Modulation is +220 ~ +403/-220 ~ -403 kHz/div & Modulated width ≧ 670 kHz using data type Fig31. 8.Adjust the B-Field Modulation if required. (Execute the command "readmod" and "wrtmod xx", where xx is the value.)	IC7, IC10, L7, C117, C118, C124, C125, R106, R109, DA1, C112, R111, C126, C127, R112, R125, C128
(K)*	Frequency Offset Check	-	Follow steps 1 to 6 of (I). 7.Confirm that the frequency offset is < ± 50 kHz.	IC7, IC10, L7, C117, C118, C124, C125, R106, R109, DA1, C112, R111, C126, C127, R112, R125, C128
(L)*	Frequency Drift Confirmation	-	Follow steps 1 to 6 of (I). 7.Confirm that the frequency drift is < ± 30 kHz/ms.	IC7, IC10, L7, C117, C118, C124, C125, R106, R109, DA1, C112, R111, C126, C127, R112, R125, C128
(M)*	Sensitivity Receiver Confirmation	-	Follow steps 1 to 6 of (I). 7.Set DECT tester power to -90 dBm. 8.Confirm that the BER is < 1000 ppm.	IC7, IC10, L7, C117, C118, C124, C125, R106, R109, DA1, C112, R111, C126, C127, R112, R125, C128
(N)*	Timing Confirmation	-	Follow steps 1 to 6 of (I). 7.Confirm that the Timing accuracy is < ± 5.0 ppm.	IC7, IC10, L7, C117, C118, C124, C125, R106, R109, DA1, C112, R111, C126, C127, R112, R125, C128

	Items	Check Point	Procedure	Check or Replace Parts
(**O**)*	Power RAMP Confirmation	-	Follow steps 1 to 6 of **(I)**. 7. Confirm that Power RAMP is matching.	IC7, IC10, L7, C117, C118, C124, C125, R106, R109, DA1, C112, R111, C126, C127, R112, R125, C128
(**P**)	Audio Check	-	1. Link with Handset. 2. Input -45 dBm/1kHz to MIC of Handset. Measure the Level at Line I/F and distortion level. 3. Confirm that the level is -8.5 dBm ± 2 dBm and that the distortion level is < 5% at TEL Line (600 Ω Load). 4. Input -20 dBm/1 kHz to Line I/F. Measure the level at Receiver of Handset and distortion level (*Receive volume set to second position from minimum). 5. Confirm that the level is -21 dBm ± 2 dBm and that the distortion level is < 5% at Receiver (Volume Middle, 150 Ω Load).	IC7, CN1, SA1, L1, L2, D3, Q3, Q4, R14, R15, R16, R17
(**Q**)	Charging Check	-	1. Connect Charge Contact 12 Ω/2 W resistor between charge+ and charge-. 2. Measure and confirm voltage across the resistor is 3.10 V ± 0.2 V.	R55, R56, D23, R57, D22

9.2.2. Check Point (Charger Unit)

	Items	Check Point	Procedure	Check or Replace Parts
(**A**)	Charging Check	-	1. Connect Charge Contact 12 Ω/2 W resistor between charge+ and charge-. 2. Measure and confirm voltage across the resistor is 3.3 V ± 0.2 V.	R1 D1, F1

Note:

After the measuring, suck up the solder of TP.

The connection of adjustment equipment is as shown in **Adjustment Standard (Charger Unit)** (P.61).

9.3. Troubleshooting by Symptom (Handset)

If your unit has below symptoms, follow the instructions in remedy column. Remedies depend on whether you have DECT tester (*1) or not.

Symptom	Remedy (*2)	
	You don't have DECT Tester.	You have DECT Tester. (Model Number : CMD60)
Battery strength is not indicated correctly by Battery icon.	Check item (**A**)-(**D**), (**G**)-(**H**).	Check item (**A**)-(**D**), (**H**)-(**I**).
You cannot hear the caller's voice.	Check item (**A**)-(**D**), (**J**).	Check item (**A**)-(**D**), (**J**)-(**M**), (**N**).
You cannot use handset a little away from base unit even if the handset is within range of the base unit.	-	Check item (**K**), (**O**).
Does not link between base unit and handset.	Check item (**A**)-(**D**), (**J**).	Check item (**A**)-(**D**), (**J**)-(**O**).
The Audio level is high or low.	Check item (**Q**).	Check item (**Q**).
The SP-Phone level is high or low.	Check item (**R**).	Check item (**R**).

Note:

(*1) A general repair is possible even if you don't have the DECT tester because it is for confirming the levels, such as Acoustic level in detail.

(*2) Refer to **Check Point (Handset)** (P.46)

9.3.1. Check Point (Handset)

Please follow the items below when BBIC or EEPROM is replaced.

Note:

After the measuring, suck up the solder of TP.

*: **Batch file Setting** (P.63) is required beforehand.

The connections of adjustment equipments are as shown in **Adjustment Standard (Handset)** (P.64).

	Items	Check Point	Procedure	Check or Replace Parts
(**A**)*	1.8 V Supply Adjustment	VDD1	1. Confirm that the voltage between test point VDD1 and GND is 1.8 V ± 0.02 V. 2. Execute the command "bandgap", then check the current value. 3. Adjust the 1.8 V voltage of VDD1 executing command "bandgap XX"(XX is the value).	IC1, Q2, C10
(**B**)	DC/DC Supply Confirmation	VDD3	1. Confirm that the voltage between test point VDD3 and GND is 4.0 V ± 0.3 V (Backlight is ON).	IC1, F1, C1, C2, C3, R1, Q1, D1, L1
(**C**)	2.5 V Supply Confirmation	VDD2	1. Confirm that the voltage between test point VDD2 and GND is 2.5 V ± 0.1 V.	IC1, Q3, C5
(**D**)*	BBIC Confirmation	-	1. BBIC Confirmation (Execute the command "getchk"). 2. Confirm the returned checksum value. Connection of checksum value and program number is shown below. ex.) | checksum value | program number | | DD3B | DAF2BA |	IC1, X1, C6, C7

(**E**)*	EEP-ROM Confirmation	-	1. EEP-ROM Confirmation (Execute the command "ChkTGA820XXrevYY").
			  XX: country code
			  YY: revision number
			2. Confirm the returned checksum value.
			Note:
			  "XX", "YY", and "checksum" vary depending on the country version. You can find them in the batch file, PQZZ- mentioned in **JIG and PC** (P.58).
				IC1, IC3, RA2

(**F**)	Charge Control Check & Charge Current Monitor Check	-	1. Apply 3.5 V between J3(+) and J4(-) with DC power supply and set current limit to 250 mA. 2. Confirm that the current limit LED of DC power supply is ON/OFF. 3. Decrease current limit of DC power supply to 100 mA. 4. Confirm that the current limit LED of DC power supply is stable. (Current limiter is ON.) (If charge control cannot be confirmed by this procedure, please use battery to handset power supply and try again.)	IC1, Q4, Q5, Q9, D7, D8, L4, L5, R5, R6, R7, F1
(**G**)*	Charge Detection (OFF) Check	-	1. Stop supplying 3.5 V to J3 CHARGE(+) and J4 CHARGE(-). 2. Execute the command "Backloff" then "charge". 3. Confirm that the returned value is 00 (hex).	IC1, Q4, Q5, Q9, D7, D8, L4, L5, R5, R6, R7, F1

	Items	Check Point	Procedure	Check or Replace Parts

(**H**)*	Battery Monitor Check	-	1. Apply 2.25 V between BATT and GND.
			2. Execute the command "readbatt".
			   It assumes that the return value is XX.
			
			   a) $1E \leqq XX \leqq 2C$: No need to adjust
			   b) XX: 18 ~ 1D: Need to adjust
			   XX: 2D ~ 32: Need to adjust
			   Write AD value of 2.25V to EEPROM.
			   ex) read data: XX = 1D, write data: YY = 1D
			   read data: XX = 2D, write data: YY = 2D
			   EEPROM = 0004(Low Voltage) write "YY"
			   Execute the command "wreeprom 00 04 01 YY".
			   EEPROM = 0005(No Voltage) write "YY - 1D"
			   Execute the command "wreeprom 00 05 01 ZZ".
			   EEPROM = 000A(Low Voltage BL) write "YY - 16"
			   Execute the command "wreeprom 00 0A 01 WW".
			Note:
			    ZZ = YY - 1D, WW = YY - 16
			   No Voltage writing data limit is '00'.
			   c) XX: 00 ~ 17: Reject
			   XX: 33 ~ FF: Reject
				IC1, F1, C1 C3, R12

(**I**)	Battery Low Confirmation	-	1. Apply 2.40 V between BATTERY(+) and BATTERY(-). 2. Confirm that there is no flashing of Battery Icon. 3. Apply 2.25 V ± 0.08 V between BATTERY(+) and BATTERY(-). 4. Confirm that there is flashing of Battery Icon.	IC1, F1, C1 C3, R12

(**J**)*	BBIC Clock Adjustment	CLK	1. Apply 2.6 V between BATTERY(+) and BATTERY(-) with DC power.
			2. Execute the command "conttx".
			3. Check X'tal Frequency. (10.368 MHz ± 100 Hz)
			   Input Command "rdeeprom 00 01 01", then you can confirm the current value.
			4. If the frequency is not 10.368 MHz ± 100Hz, adjust the frequency of CLK executing the command "setfreq xx (where xx is the value)" so that the reading of the frequency counter is 10.368000 MHz ± 10 Hz.
			Note:
			   CLK is displayed only for a few seconds when executing the command "conttx" after battery is inserted.
				IC1, X1, C6, C7, IC4, C57

(**K**)*	Transmitted Power Confirmation	-	Remove the Antenna before starting step from 1 to 4.
			1. Configure the DECT tester (CMD60) as follows;
			   <Setting>
			   • Test mode: PP
			   • RFPI: 0102030405
			   • Traffic Carrier: 5
			   • Traffic Slot: 4
			   • Mode: Loopback
			   • RF LEVEL = -70 dBm
			   • PACKET: PP32Z
			2. Execute the command "regcmd60 01 02 03 04 05".
			3. Initiate connection from DECT tester.
			4. Confirm that the NTP value at ANT is 20 dBm ~ 25 dBm.
				IC1, IC4, C58, C57, C50, C52, C53, R52, C60, C61

(**L**)*	Modulation Check and Adjustment	-	Follow steps 1 to 3 of (**K**). 4.Confirm that the B-Field Modulation is +220 ~ +403/-220 ~ -403 kHz/div & Modulated width $\geqq$ 670 kHz using data type Fig 31. 5.Adjust the B-Field Modulation if required. (Execute the command "Readmod" and "wrtmod xx", where xx is the value.)	IC1, IC4, C58, C57, C52, C53, R52, C61, C59, C125, C62
(**M**)*	Frequency Offset Confirmation	-	Follow steps 1 to 3 of (**K**). 4.Confirm that the frequency Offset is < ± 50 kHz.	IC1, IC4, C58, C57, C52, C53, R52, C61, C59, C125, C62
(**N**)*	Frequency Drift Confirmation	-	Follow steps 1 to 3 of (**K**). 4.Confirm that the frequency Drift is < ± 30 kHz/ms.	IC1, IC4, C58, C57, C52, C53, R52, C61, C59, C125, C62
(**O**)*	Sensitivity Receiver Confirmation	-	Follow steps 1 to 3 of (**K**). 4.Set DECT tester power to -88 dBm. 5.Confirm that the BER is < 1000 ppm.	IC1, IC4, C58, C57, C52, C53, R52, C61, C59, C125, C62

	Items	Check Point	Procedure	Check or Replace Parts
(**P**)*	Power RAMP Confirmation	-	Follow steps 1 to 3 of **(K)**. 4.Confirm that Power RAMP is matching.	IC1, IC4, C58, C57, C52, C53, R52, C61, C59, C125, C62
(**Q**)	Audio Check and Confirmation	-	1. Link to BASE which is connected to Line Simulator. 2. Set line voltage to 48 V and line current to 40 mA. 3. Input -45 dBm/1 KHz to MIC and measure Line output level. 4. Confirm that the level is -8.5 dBm ± 2 dBm and that the distortion level is < 5 % at TEL Line (600 Ω Load). 5. Input -20 dBm/1KHz to Line I/F and measure Receiving level at REV1 and REV2. 6. Confirm that the level is -21 dBm ± 2 dBm and that the distortion level is < 5 % at Receiver. (vol = 2)	IC1, R23, R24, R25, C11, C12, C75, C70, C71
(**R**)	SP phone Audio Check and Confirmation	-	1. Link to Base which is connected to Line Simulator. 2. Set line voltage to 48 V and line current to 40 mA. 3. Set the handset off-hook using SP-Phone key. 4. Input -25 dBm/1KHz to Line I/F and measure Receiving level at SP_TEST1 and SP_TEST2. 5. Confirm that the level is -14 dBm ± 2 dBm and that the distortion level is < 5 %. (vol = 3)	IC1, R23, R24, R25, C11, C39, C12, C75, C99, C111

9.3.2.   Troubleshooting for Speakerphone

When the customer's telephone line corresponds to the following conditions, and the transmission signal of SP-Phone is interrupted, performing the next set up to a cordless handset will improve it to some extent.

Conditions

1. When customer's line has less line loss.

   ex.) The customer is using optical fiber, ISDN terminal adaptor, or PBX.

   In this case, receiving signal is strong and it may affect transmission signal.

2. When the other party is talking from noisy place.

   ex.) The other party is using cellular phone. The background noise is very loud.

   In this case, the noise from the other party (i.e. surrounding noise) may affect transmission signal.

Setting Method

• Change the handset address of EEPROM (0128) from 00 to 01 by **Engineering Mode**.

9.4. How to Replace the Flat Package IC

Even if you do not have the special tools (for example, a spot heater) to remove the Flat IC, with some solder (large amount), a soldering iron and a cutter knife, you can easily remove the ICs that have more than 100 pins.

9.4.1. Preparation

• PbF (: Pb free) Solder

• Soldering Iron

Tip Temperature of 700 °F ± 20 °F (370 °C ± 10 °C)

Note: We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.

• Flux

Recommended Flux: Specific Gravity → 0.82.

Type → RMA (lower residue, non-cleaning type)
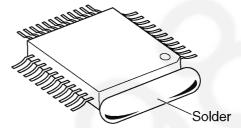
 Note: See **About Lead Free Solder (Pbf: Pb free)** (P.4)

9.4.2. How to Remove the IC
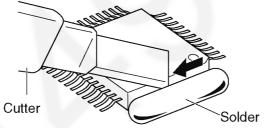
1. Put plenty of solder on the IC pins so that the pins can be completely covered.

   Note:
   If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.
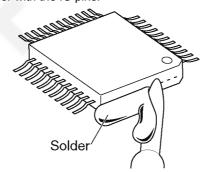
Solder

2. Make a few cuts into the joint (between the IC and its pins) first and then cut off the pins thoroughly.

Cutter

Solder

3. While the solder melts, remove it together with the IC pins.

Solder
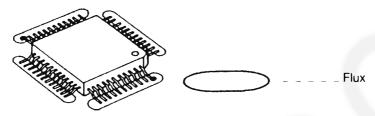
When you attach a new IC to the board, remove all solder left on the board with some tools like a soldering wire. If some solder is left at the joint on the board, the new IC will not be attached properly.

9.4.3. How to Install the IC
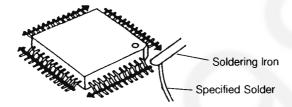
1. Temporarily fix the FLAT PACKAGE IC, soldering the two marked pins.

●‒ ‒ ‒ ‒ ‒ ‒Temporary soldering point.

*Check the accuracy of the IC setting with the corresponding soldering foil.

2. Apply flux to all pins of the FLAT PACKAGE IC.

‒ ‒ ‒ ‒ ‒Flux
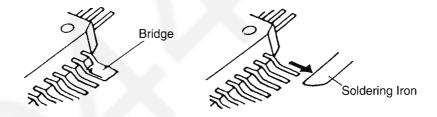
3. Solder the pins, sliding the soldering iron in the direction of the arrow.

Soldering Iron

Specified Solder

9.4.4. How to Remove a Solder Bridge

1. Lightly resolder the bridged portion.
2. Remove the remaining solder along the pins using a soldering iron as shown in the figure below.

Bridge

Soldering Iron

9.5.   How to Replace the LLP (Leadless Leadframe Package) IC

9.5.1.   Preparation

• PbF (: Pb free) Solder
• Soldering Iron
  Tip Temperature of 700°F ± 20°F (370°C ± 10°C)
  Note:
  We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.
• Hot Air Desoldering Tool
  Temperature: 608°F ± 68°F (320°C ± 20°C)
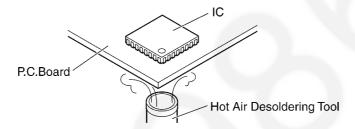
9.5.2.   Caution

• To replace the IC efficiently, choose the right sized nozzle of the hot air desoldering tool that matches the IC package.
• Be careful about the temperature of the hot air desoldering tool not to damage the PCB and/or IC.

9.5.3.   How to Remove the IC
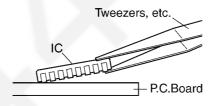
1. Heat the IC with a hot air desoldering tool through the P.C.Board.
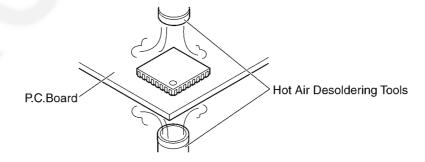
2. Pick up the IC with tweezers, etc. when the solder is melted completely.
   Note:
   • Be careful not to touch the peripheral parts with tweezers, etc. They are unstable.
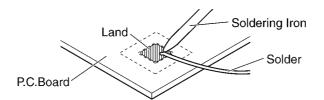
When it is hard to melt the solder completely, heat it with a hot air desoldering tool through the IC besides through the P.C.Board.
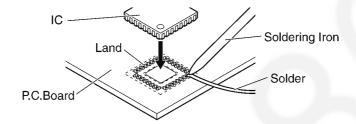
3. After removing the IC, clean the P.C.Board of residual solder.

9.5.4. How to Install the IC
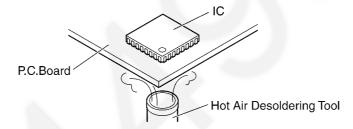
1. Place the solder a little on the land where the radiation GND pad on IC bottom is to be attached.

2. Place the solder a little on the land where IC pins are to be attached, then place the IC.
   Note:
   • When placing the IC, the positioning should be done very carefully.
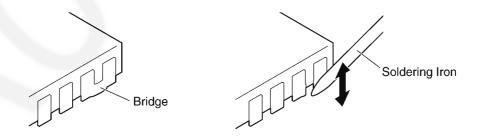
3. Heat the IC with a hot air desoldering tool through the P.C.Board until the solder on IC bottom is melted.
   Note:
   • Be sure to place it precisely, controlling the air volume of the hot air desoldering tool.

4. After soldering, confirm there are no short and open circuits with visual inspection.

9.5.5. How to Remove a Solder Bridge

When a Solder Bridge is found after soldering the bottom of the IC, remove it with a soldering iron.
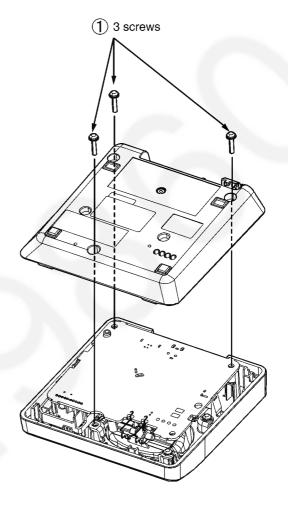
10 Disassembly and Assembly Instructions

10.1. Disassembly Instructions

10.1.1. Base Unit

① **Remove the 3 screws to remove the cabinet cover.**

① 3 screws
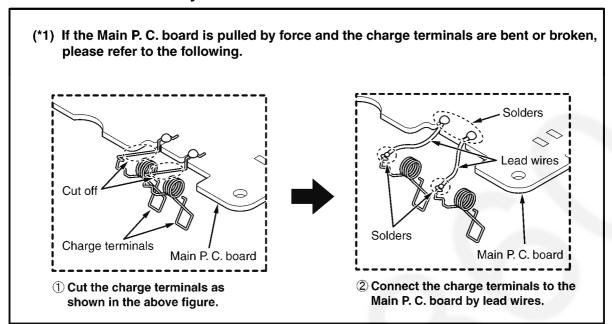
② **Remove the solders to remove the main P.C. board.**

Main P. C. board

(*1)

② Solders

<Note for Disassembly>

(*1) If the Main P. C. board is pulled by force and the charge terminals are bent or broken, please refer to the following.

Cut off

Charge terminals

Main P. C. board

Solders

Lead wires

Solders

Main P. C. board

① Cut the charge terminals as shown in the above figure.

② Connect the charge terminals to the Main P. C. board by lead wires.
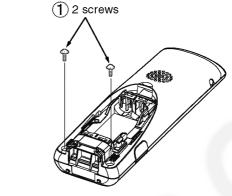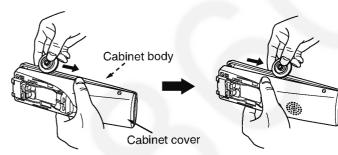
10.1.2. Handset
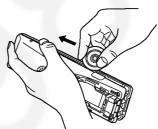
① **Remove the 2 screws.**

① 2 screws

② **Insert a JIG (PQDJ10006Y) between the cabinet body and the cabinet cover, then pull it along the gap to open the cabinet.**

Cabinet body

Cabinet cover
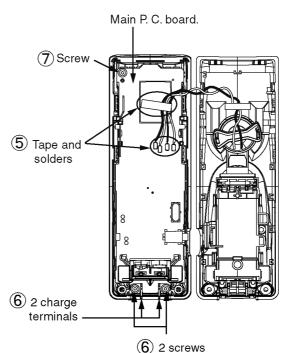
③ **Likewise, open the other side of the cabinet.**

④ **Remove the cabinet cover by pushing it upward.**

Cabinet cover

Main P. C. board.

⑦ Screw
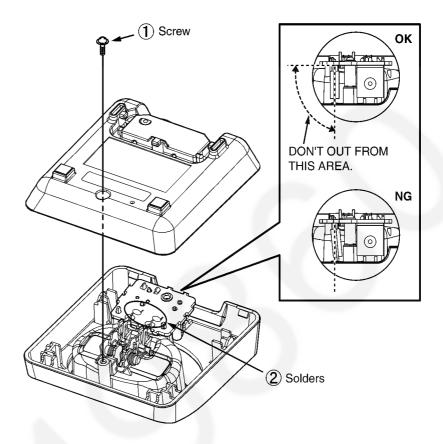
⑤ **Remove the tape and solders.**

⑤ Tape and solders

⑥ **Remove the 2 screws to remove the 2 charge terminals.**

⑦ **Remove the screw to remove the main P. C. board.**

⑥ 2 charge terminals

⑥ 2 screws
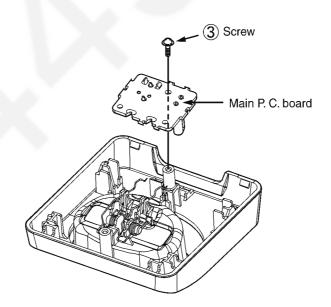
10.1.3. Charger Unit

① **Remove the screw to remove the cabinet cover.**

② **Remove the solders.**

① Screw

OK

DON'T OUT FROM THIS AREA.

NG

② Solders

③ **Remove the screw to remove the main P. C. board.**

③ Screw

Main P. C. board
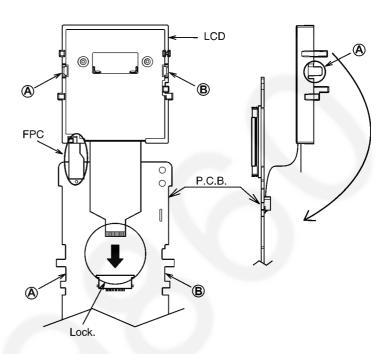
10.2. Assembly Instructions
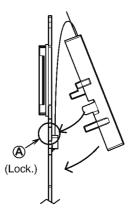
10.2.1. Fix the LCD to the Main P.C. Board (Handset)
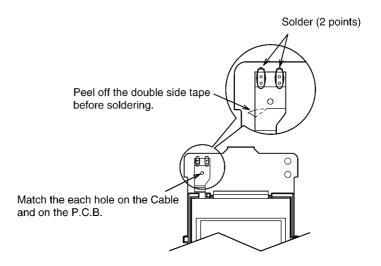
① Attach LCD to P.C.B.
*When attaching the LCD holder,
don't pull the FPC (Flexible Print Circuit).

② Locate the Flat Cable inside as shown.

③ Solder the narrow Cable to the P.C.B.
*When soldering, don't give the load to the FPC.

Solder (2 points)

Peel off the double side tape
before soldering.

Match the each hole on the Cable
and on the P.C.B.

11 Measurements and Adjustments

11.1. The Setting Method of JIG (Base Unit)

11.1.1. Preparation

11.1.1.1. Equipment Required

- DECT tester: Rohde & Schwarz, CMD 60 is recommended.
- Frequency counter: It must be precise enough to measure intervals of 1 Hz (precision; ±4 ppm).
  Hewlett Packard, 53131A is recommended.
- Digital multi-meter (DMM): It must be able to measure voltage and current.
- Oscilloscope

11.1.1.2. JIG and PC

- Serial JIG
  JIG Cable: PQZZ1CD300E*
- PC which runs in DOS mode
- **Batch file CD-ROM** for setting: PQZZTG8200BX

Note:
*: If you have the JIG Cable for TCD500 series (PQZZ1CD505E), change the following values of resistance. Then you can use it as a JIG Cable for both TCD300 and TCD500 series. (It is an upper compatible JIG Cable.)
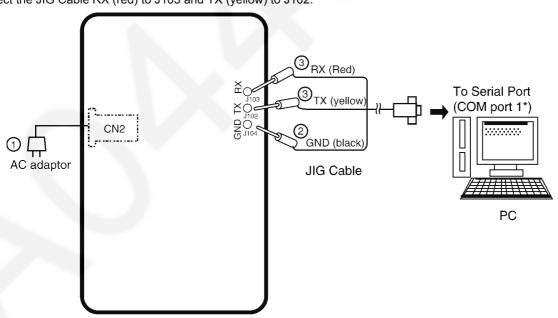
Resistor	Old value (kΩ)	New value (kΩ)
R2	22	3.3
R3	22	3.3
R4	22	4.7
R7	4.7	10

11.1.2. PC Setting

11.1.2.1. Connections

① Connect the AC adaptor to CN2 (base unit).

② Connect the JIG Cable GND (black) to J104.

③ Connect the JIG Cable RX (red) to J103 and TX (yellow) to J102.

Base unit P. C. board

Note:
*: COM port names may vary depending on what your PC calls it.

11.1.2.2. Batch file Setting

1. Insert the Batch file CD-ROM into CD-ROM drive and copy PQZZTG**** folder to your PC (example: D drive).

<Example for Windows>

2. Open an MS-DOS mode window.

On your computer, click **[Start]**, select **Programs** (**All Programs** for Windows XP/Windows Server 2003), then click
MS-DOS Prompt. (for Windows 95/Windows 98)
Or
Accessories-MS-DOS Prompt. (for Windows Me)
Or
Command Prompt. (for Windows NT 4.0)
Or
Accessories-Command Prompt.
(for Windows 2000/Windows XP/Windows Server 2003)

3. At the DOS prompt, type "**D:**" (for example) to select the drive, then press the **Enter** key.

4. Type "**CD ¥PQZZTG****", then press the **Enter** key.

<Example: correct setting>

```
C: ¥Documents and Settings>D:
D: ¥>CD ¥PQZZTG****
D: ¥PQZZTG**** >SET_COM=X
D: ¥PQZZTG****>READID
00 52 4F A8 A8
D: ¥PQZZTG****>DOSKEY
D: ¥PQZZTG****>
```

5. Type "**SET_COM=X**", then press the **Enter** key
(**X**: COM port number used for the serial connection on your PC).

6. Type "**READID**", then press the **Enter** key.
　·If any error messages appear, change the port number or check the cable connection.
　·If any value appear, go to next step.

7. Type "**DOSKEY**", then press the **Enter** key.

<Example: incorrect setting>

```
C: ¥Documents and Settings>D:
D: ¥>CD ¥PQZZTG****
D: ¥PQZZTG**** >SET_COM=X
D: ¥PQZZTG****>READID
   CreateFile error
ERROR 10: Can't open serial port
D: ¥PQZZTG ****>
```

Note:
• "****" varies depending on the country.

11.1.2.3. Commands
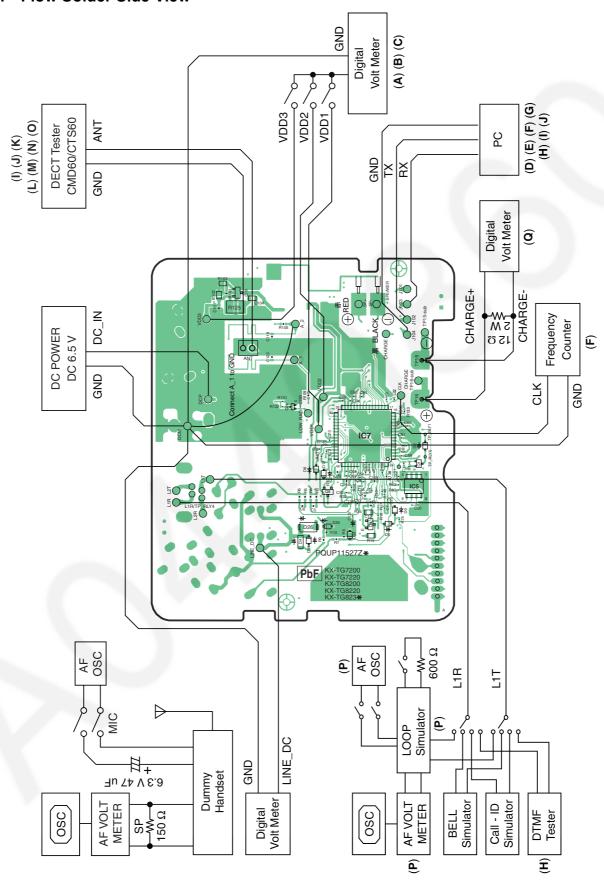
See the table below for frequently used commands.

Command name	Function	Example
rdeeprom	Read the data of EEPROM	Type "rdeeprom 00 00 FF", and the data from address "00 00" to "FF" is read out.
readid	Read ID (RFPI)	Type "readid", and the registered ID is read out.
writeid	Write ID (RFPI)	Type "writeid 00 18 E0 0E 98", and the ID "0018 E0 0E 98" is written.
setfreq	Adjust Frequency of RFIC	Type "setfreq nn".
hookoff	Off-hook mode on Base	Type "hookoff".
hookon	On-hook mode on Base	Type "hookon".
getchk	Read checksum	Type "getchk".
wreeprom	Write the data of EEPROM	Type "wreeprom 01 23 45". "01 23" is address and "45" is data to be written.

11.2. Adjustment Standard (Base Unit)

When connecting the simulator equipments for checking, please refer to below.

11.2.1. Flow Solder Side View
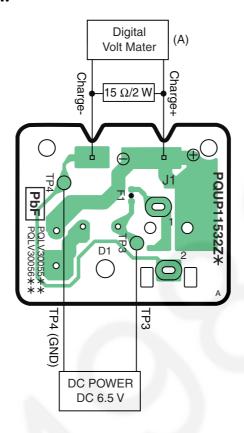
Note:

(**A**) - (**Q**) is referred to **Check Point (Base Unit)** (P.43)

11.3. Adjustment Standard (Charger Unit)

When connecting the simulator equipment for checking, please refer to below.

11.3.1. Flow Solder Side View

Note:

(**A**) is referred to **Check Point (Charger Unit)** (P.45)

11.4. The Setting Method of JIG (Handset)

11.4.1. Preparation

11.4.1.1. Equipment Required

- DECT tester: Rohde & Schwarz, CMD 60 is recommended.
- Frequency counter: It must be precise enough to measure intervals of 1 Hz (precision; ±4 ppm).
  Hewlett Packard, 53131A is recommended.
- DC power: It must be able to output at least 1 A current under 2.4 V for Handset.
- Digital multi-meter (DMM): It must be able to measure voltage and current.
- Oscilloscope

11.4.1.2. JIG and PC

- Serial JIG
  JIG Cable: PQZZ1CD300E*
- PC which runs in DOS mode.
- **Batch file CD-ROM** for setting: PQZZTG8200BX

Note:
*: If you have the JIG Cable for TCD500 series (PQZZ1CD505E), change the following values of resistance. Then you can use it as a JIG Cable for both TCD300 and TCD500 series. (It is an upper compatible JIG Cable.)
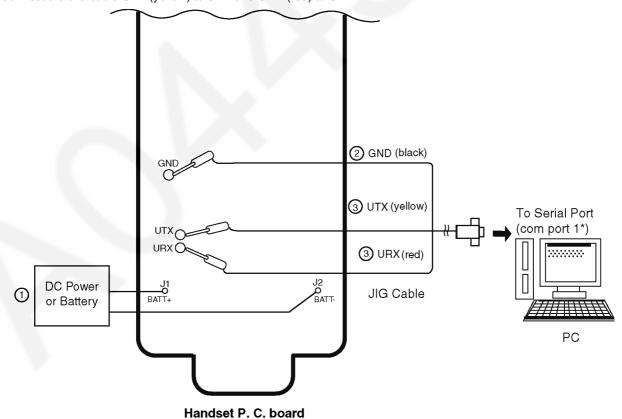
Resistor	Old value (kΩ)	New value (kΩ)
R2	22	3.3
R3	22	3.3
R4	22	4.7
R7	4.7	10

11.4.2. PC Setting

11.4.2.1. Connections

① Connect the DC Power or Battery to J1 (BATT+) and J2 (BATT-).

② Connect the JIG cable GND (black) to GND.

③ Connect the JIG cable UTX (yellow) to UTX and URX (red) to URX.

Handset P. C. board

Note:
*: Com port names may vary depending on what your PC calls it.

11.4.2.2. Batch file Setting

1. Insert the Batch file CD-ROM into CD-ROM drive and
copy PQZZTG***** folder to your PC (example: D drive).

<Example for Windows>

2. Open an MS-DOS mode window.

On your computer, click **[Start]**, select **Programs**
(**All Programs** for Windows XP/Windows Server 2003),
then click
MS-DOS Prompt. (for Windows 95/Windows 98)
Or
Accessories-MS-DOS Prompt. (for Windows Me)
Or
Command Prompt. (for Windows NT 4.0)
Or
Accessories-Command Prompt.
(for Windows 2000/Windows XP/Windows Server 2003)

3. At the DOS prompt, type "**D:**" (for example) to select the
drive, then press the **Enter** key.

4. Type "**CD ¥PQZZTG*****"**, then press the **Enter** key.

<Example: correct setting>

5. Type "**SET RTX_COM=X**", then press the **Enter** key
(**X**: COM port number used for the serial connection on your PC).

```
C: ¥Documents and Settings>D:
D: ¥>CD ¥PQZZTG*****
D: ¥PQZZTG***** >SET RTX_COM=X
D: ¥PQZZTG*****>READID
00 52 4F A8 A8
D: ¥PQZZTG*****>DOSKEY
D: ¥PQZZTG*****> ▄
```

6. Type "**READID**", then press the **Enter** key.
・If any error messages appear, change the port number or
check the cable connection.
・If any value appear, go to next step.

7. Type "**DOSKEY**", then press the **Enter** key.

<Example: incorrect setting>

```
C: ¥Documents and Settings>D:
D: ¥>CD ¥PQZZTG*****
D: ¥PQZZTG***** >SET RTX_COM=X
D: ¥PQZZTG*****>READID
   CreateFile error
ERROR 10: Can't open serial port
D: ¥PQZZTG*****> ▄
```

Note:
• "*****" varies depending on the country.

11.4.2.3. Commands
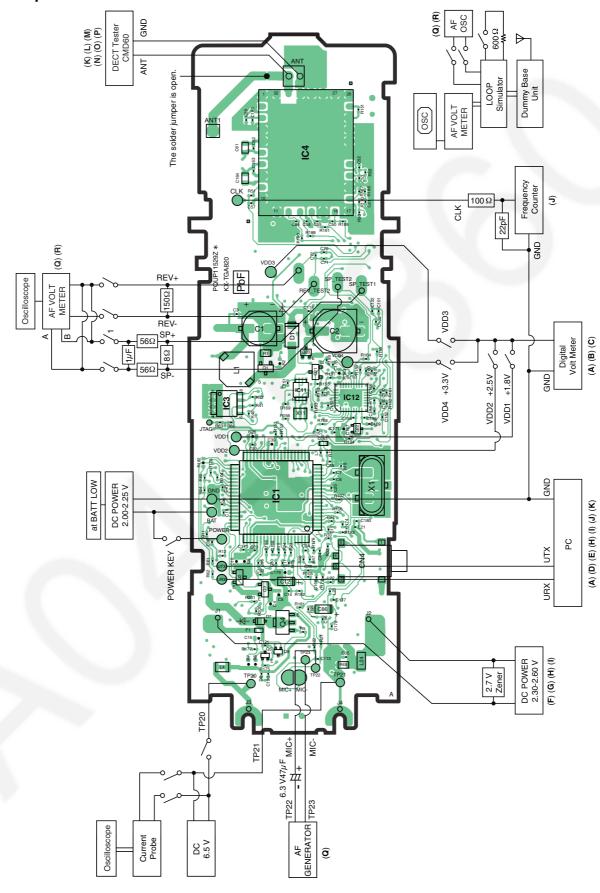
See the table below for frequently used commands.

Command name	Function	Example
rdeeprom	Read the data of EEPROM	Type "rdeeprom 00 00 FF", and the data from address "00 00" to "FF" is read out.
readid	Read ID (RFPI)	Type "readid", and the registered ID is read out.
writeid	Write ID (RFPI)	Type "writeid 00 18 E0 0E 98", and the ID "0018 E0 0E 98" is written.
setfreq	Adjust Frequency of RFIC	Type "setfreq nn".
getchk	Read checksum	Type "getchk".
wreeprom	Write the data of EEPROM	Type "wreeprom 01 23 45". "01 23" is address and "45" is data to be written.

11.5. Adjustment Standard (Handset)

When connecting the simulator equipments for checking, please refer to below.

11.5.1. Component View

Note:

(**A**) - (**R**) is referred to **Check Point (Handset)** (P.46)

11.6. Things to Do after Replacing IC or X'tal

Cautions:

Some of the content on this page may not apply to models from some countries. The contents below are the minimum adjustments required for operation.

11.6.1. Base Unit

Before making the following adjustment, ensure you have carried out **PC Setting** (P.58) in **The Setting Method of JIG (Base Unit)**.

Items		Necessary Adjustment
BBIC (FLASH type) (IC7)	Programs for Voice processing, interface for RF and EEPROM	1. Make sure to connect the JIG cable, then detach the DC Power. 2. Execute the command "flw438 ************.hex". 3. Connect the DC Power. 4. Press the PC Enter key once. 5. After a few minutes, "Successful upgrade" is displayed on the PC indicating downloading has finished. 6. Detach the JIG cable, then disconnect the DC Power. 7. Connect the DC Power. 8. Connect the JIG cable again, and execute the command "getchk", then confirm the checksum value is correct. • If the downloading fails, start again from step 1. 9. Default batch file: Execute the command "default.bat". 10. Country version batch file: Execute the command "TG8200XXrevYY.bat". (*1) 11. Clock adjustment: Refer to Check Point (F). (*2)
EEPROM (IC5)	Adjustment parameter data (country version batch file, default batch file, etc.)	1. Change the address "0000" of EEPROM to "00". 2. Default batch file: Execute the command "default.bat". 3. Country version batch file: Execute the command "TG8200XXrevYY.bat". (*1) 4. Clock adjustment: Refer to Check Point (F). (*2)
X'tal (X1)	System clock	1. Refer to Check Point (F). (*2)

Note:

(*1) XX: country code, YY: revision number

"XX" and "YY" vary depending on the country version. You can find them in the batch file, PQZZ- mentioned in **JIG and PC** (P.58).

(*2) Refer to **Check Point (Base Unit)** (P.43)

11.6.2. Handset

Before making the following adjustment, ensure you have carried out **PC Setting** (P.62) in **The Setting Method of JIG (Handset)**.

	Items	Necessary Adjustment
BBIC (FLASH type) (IC1)	Programs for Voice processing, interface for RF and EEPROM	1. Make sure to connect the JIG cable, then detach the DC Power. 2. Execute the command "flw430 ************.hex". 3. Connect the DC Power. 4. Press and hold the handset Power key. 5. While holding down the handset Power key, press the PC Enter key once. 6. After a few minutes, "Successful upgrade" is displayed on the PC indicating downloading has finished. 7. Detach the JIG cable, then press the handset Power key to turn it on. 8. Connect the JIG cable again, and execute the command "getchk", then confirm the checksum value is correct. • If the downloading fails, start again from step 1. 9. Default batch file: Execute the command "default.bat". 10. Default batch file (remaining): Execute the Command "TGA820DEFrevYY.bat". (*3) 11. Country version batch file: Execute the command "TGA820XXrevYY". (*3) 12. Clock adjustment: Refer to Check Point (J). (*4) 13. 1.8 V setting and battery low detection: Refer to Check Point (A), (H) and (I). (*4)
EEPROM (IC3)	Adjustment parameter data (country version batch file, default batch file, etc.)	1. Default batch file: Execute the command "default.bat". 2. Default batch file (remaining): Execute the Command "TGA820DEFrevYY.bat". (*3) 3. Country version batch file: Execute the command "TGA820XXrevYY". (*3) 4. Clock adjustment: Refer to Check Point (J). (*4) 5. 1.8 V setting and battery low detection: Refer to Check Point (A), (H) and (I). (*4)
X'tal (X1)	System clock	1. Refer to Check Point (J). (*4)

Note:

(*3) XX: country code, YY: revision number

"XX" and "YY" vary depending on the country version. You can find them in the batch file, PQZZ- mentioned in **JIG and PC** (P.58).

(*4) Refer to **Check Point (Handset)** (P.46)

11.7. RF Specification

11.7.1. Base Unit

Item	Value	Refer to -. *
TX Power	20.7 dBm ~ 25.7 dBm	**Check Point (Base Unit) (I)**
Modulation	-220 ~ -403/+220 ~ +403 kHz/div & Modulated width ≥ 670 kHz	**Check Point (Base Unit) (J)**
Frequency Offset	-50 kHz ~ +50 kHz	**Check Point (Base Unit) (K)**
Frequency Drift	< ± 30 kHz / ms	**Check Point (Base Unit) (L)**
RX Sensitivity	< 1000 ppm	**Check Point (Base Unit) (M)**
Timing Accuracy	< ± 5.0 ppm	**Check Point (Base Unit) (N)**
Power RAMP	Power RAMP is matching	**Check Point (Base Unit) (O)**

*: Refer to **Check Point (Base Unit)** (P.43)
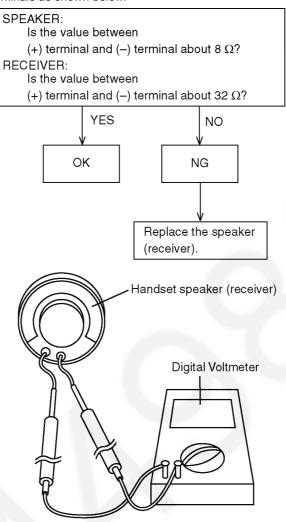
11.7.2. Handset

Item	Value	Refer to -. **
TX Power	20 dBm ~ 25 dBm	**Check Point (Handset) (K)**
Modulation	-220 ~ -403/+220 ~ +403 kHz/div & Modulated width ≥ 670 kHz	**Check Point (Handset) (L)**
Frequency Offset	-50 kHz ~ +50 kHz	**Check Point (Handset) (M)**
Frequency Drift	< ± 30 kHz / ms	**Check Point (Handset) (N)**
RX Sensitivity	< 1000 ppm	**Check Point (Handset) (O)**
Power RAMP	Power RAMP is matching	**Check Point (Handset) (P)**

: Refer to **Check Point (Handset) (P.46)

11.8. How to Check the Handset Speaker or Receiver

1. Prepare the digital voltmeter, and set the selector knob to ohm meter.
2. Put the probes at the speaker terminals as shown below.

```
SPEAKER:
    Is the value between
    (+) terminal and (−) terminal about 8 Ω?
RECEIVER:
    Is the value between
    (+) terminal and (−) terminal about 32 Ω?
```

YES   NO

OK   NG

Replace the speaker
(receiver).

Handset speaker (receiver)

Digital Voltmeter

11.9. Frequency Table (MHz)

| Channel No | BASE UNIT | | HANDSET | |
	Transmit Frequency	Receive Frequency	Transmit Frequency	Receive Frequency
1	1897.344	1897.344	1897.344	1897.344
2	1895.616	1895.616	1895.616	1895.616
3	1893.888	1893.888	1893.888	1893.888
4	1892.160	1892.160	1892.160	1892.160
5	1890.432	1890.432	1890.432	1890.432
6	1888.704	1888.704	1888.704	1888.704
7	1886.976	1886.976	1886.976	1886.976
8	1885.248	1885.248	1885.248	1885.248
9	1883.520	1883.520	1883.520	1883.520
10	**1881.792**	**1881.792**	**1881.792**	**1881.792**

Note:
   Channel No. 10: In the Test Mode on Base Unit and Handset.

12 Schematic Diagram

12.1. For Schematic Diagram

12.1.1. Base Unit (Schematic Diagram (Base Unit))

Notes:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

> Important Safety Notice:
> Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

2. The schematic diagrams may be modified at any time with the development of new technology.

12.1.2. Handset (Schematic Diagram (Handset))

Notes:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.

2. The schematic diagram may be modified at any time with the development of new technology.

12.1.3. Charger Unit (Schematic Diagram (Charger Unit))

Notes:
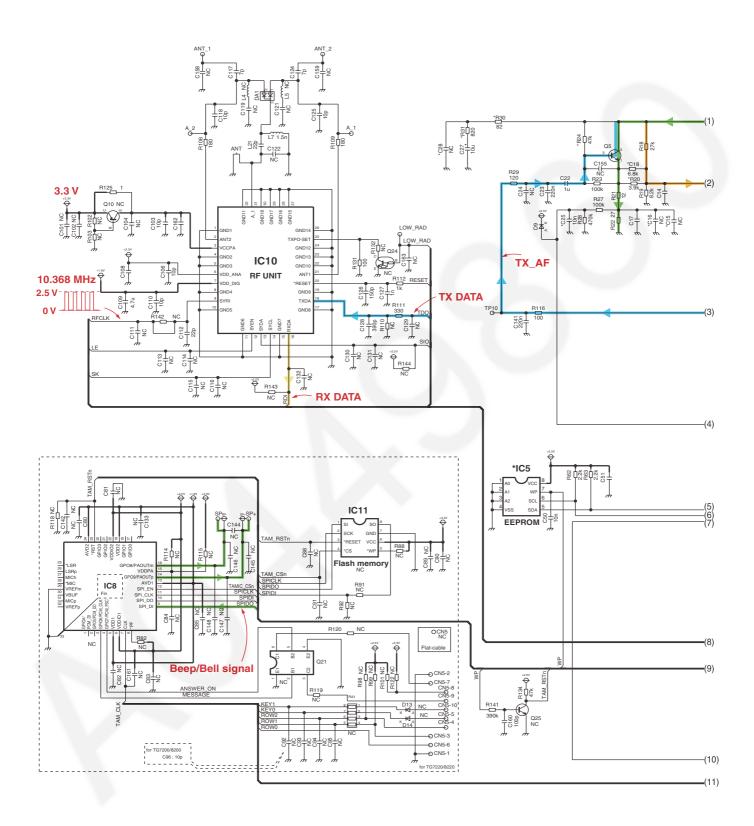
1. DC voltage measurements are taken with voltmeter from the negative voltage line.

> Important Safety Notice:
> Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.
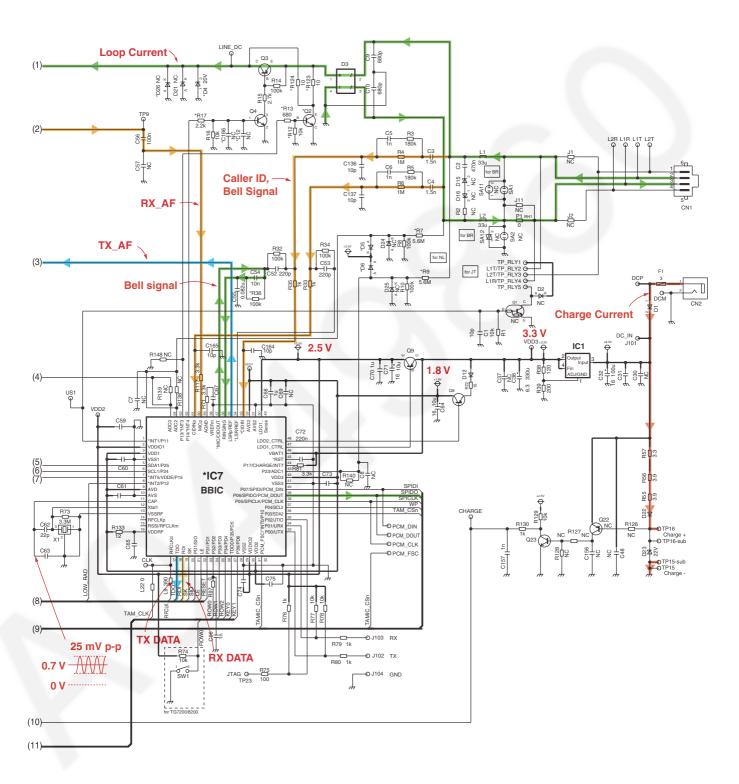
2. The schematic diagram may be modified at any time with the development of new technology.

12.2. Schematic Diagram (Base Unit)

3.3 V

10.368 MHz
2.5 V
0 V

IC10
RF UNIT

TX_AF

TX DATA

RX DATA

Beep/Bell signal

IC8

IC11
Flash memory

IC5
EEPROM

NC: No Components

70
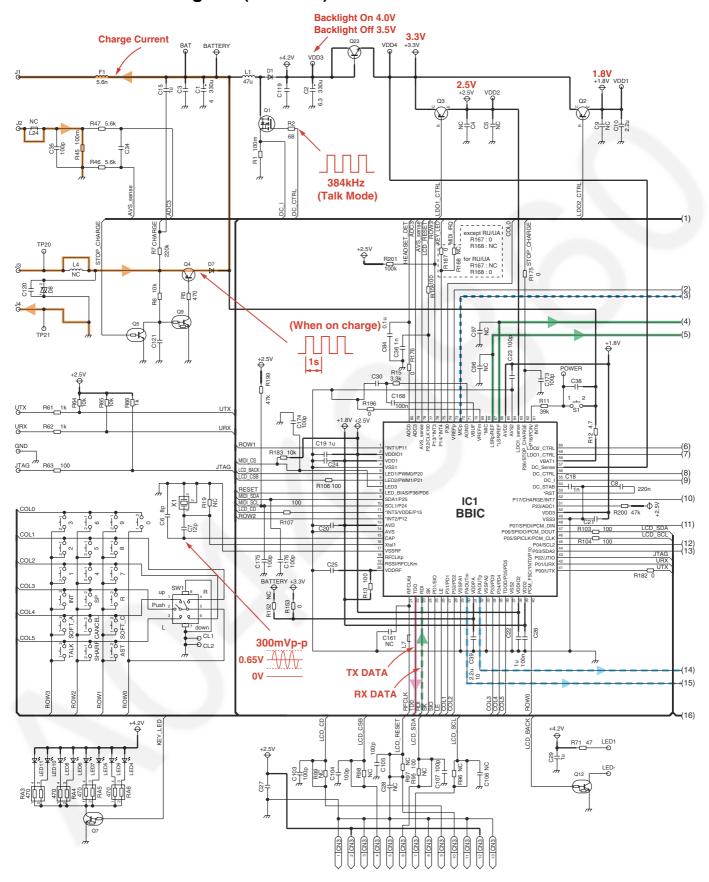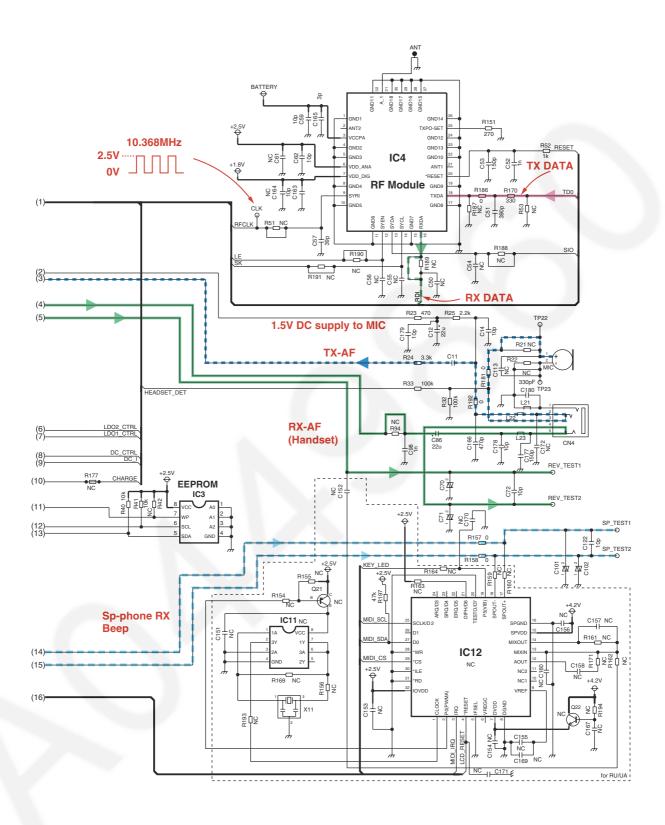
NC: No Components

KX-TG8200BX SCHEMATIC DIAGRAM (Base Unit_Main)

12.3. Schematic Diagram (Handset)

NC: No Components

10.368MHz
2.5V
0V

TX DATA
RX DATA
1.5V DC supply to MIC
TX-AF
RX-AF (Handset)
Sp-phone RX Beep

IC4 RF Module

EEPROM IC3
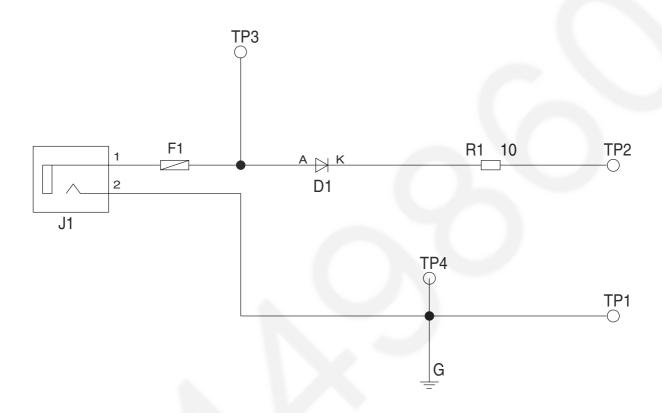
NC: No Components

KX-TGA820 SCHEMATIC DIAGRAM (Handset)

12.4. Schematic Diagram (Charger Unit)
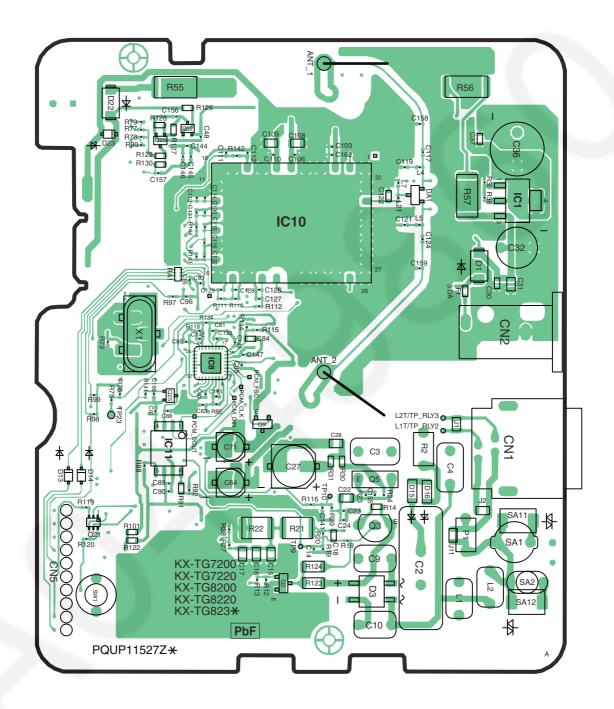
SCHEMATIC DIAGRAM (Charger Unit)

13 Printed Circuit Board
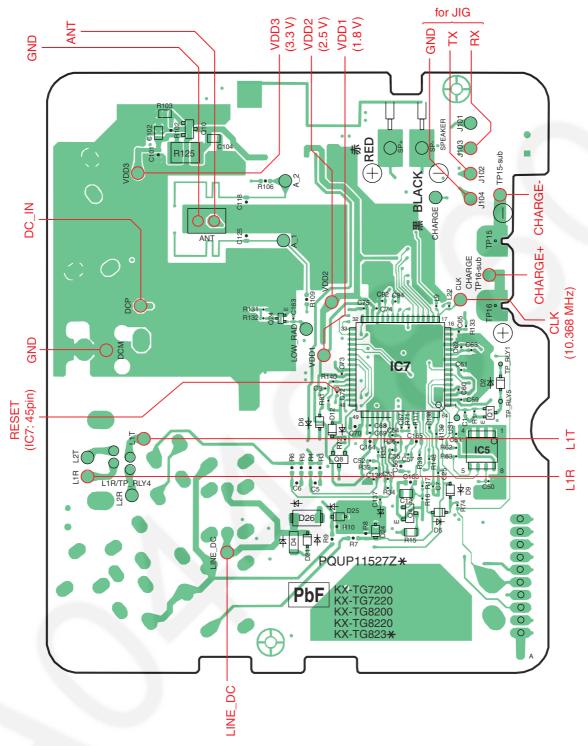
13.1. Circuit Board (Base Unit_MAIN)

13.1.1. Component View

KX-TG8200 CIRCUIT BOARD (Base Unit (Component View))

75
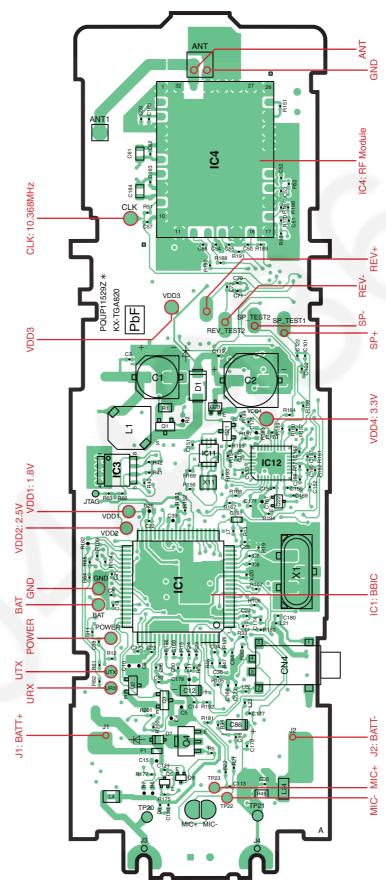
13.1.2. Flow Solder Side View

KX-TG8200 CIRCUIT BOARD (Base Unit (Flow Solder Side View))
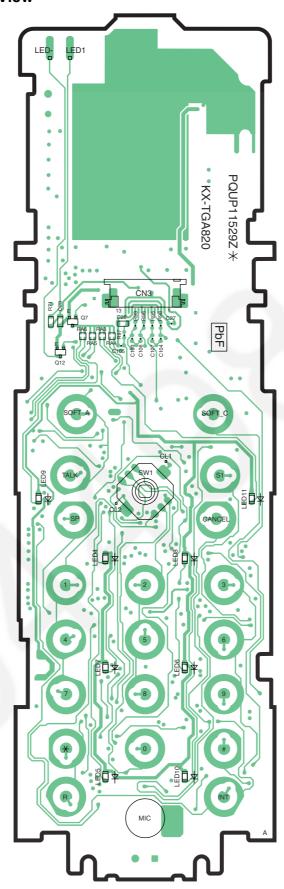
13.2. Circuit Board (Handset)

13.2.1. Component View

KX-TGA820 CIRCUIT BOARD (Handset (Component View))
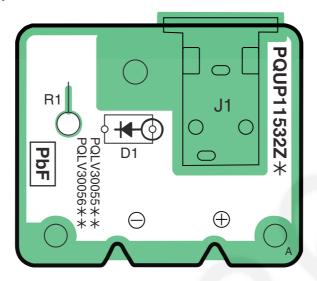
13.2.2. Flow Solder Side View

KX-TGA820 CIRCUIT BOARD (Handset (Flow Solder Side View))
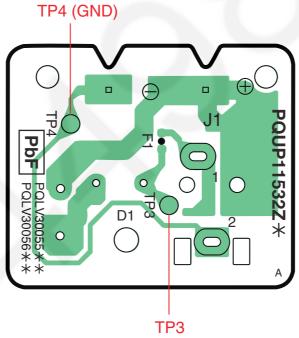
13.3. Circuit Board (Charger Unit)

13.3.1. Component View

CIRCUIT BOARD (Charger Unit (Component View))

13.3.2. Flow Solder Side View

CIRCUIT BOARD (Charger Unit (Flow Solder Side View))

14 Appendix Information of Schematic Diagram

14.1. CPU Data (Base Unit)

14.1.1. IC7 (BBIC)

Pin No.	Description	I/O	Connection	at Normal mode	at Reset mode
1	*INT1/P11	D.O	RLY	O	I-PU
2	VDDIO1	-	-	-	-
3	VDD1	-	-	-	-
4	VSS1	-	-	-	-
5	SDA1/P25	D.I/O	SDA1	I/O	I
6	SCL1/P24	D.O	SCL1	O	I
7	*INT5/VDDE/P15	D.I	NC	I	O-H
8	*INT2/P12	D.O	Low_rad	O	I-PU
9	AVD	-	-	-	-
10	AVS	-	-	-	-
11	CAP	A.I	CAP	I	I
12	Xtal1	A.I	Xtal1	I	-
13	VSSRF	-	-	-	-
14	RFCLKp	A.O	NC	O	Hi-Z
15	RSSI/RFCLKm	A.I	NC	I	Hi-Z
16	VDDRF	-	-	-	-
17	RFCLKd	D.O	RFCLKd	O	O-L
18	TDO	A.O	TDO	O	O
19	RDI	D.I	RDI	I	I
20	SK	D.O	SK	O	O-L
21	PD1/SIO	D.I/O	SIO	I/O	I-PD
22	LE	D.O	LE	O	O-L
23	P31/PD1	D.O	RESET(RF)	O	I-PD
24	P32/PD2	D.I	ROW0	I	I-PD
25	P33/PD3	D.O	NC	O	I-PD
26	P34/PD4	D.O	NC	O	I-PD
27	TDOD/P35/PD5	D.O	NC	O	I-PD
28	P36/PD6	D.O	NC	O	I-PD
29	VSS2	-	-	-	-
30	VDDIO2	-	-	-	-
31	VDD2	-	-	-	-
32	PCM_FSC/*INT0/P10	D.O	NC	O	I-PU
33	P00/UTX	D.O	UTX	O	I-PU
34	P01/URX	D.I	URX	I	I-PU
35	P02/JTIO	D.I/O	JTAG	I/O	I-PU
36	P03/SDA2	D.O	NC	O	I-PU
37	P04/SCL2	D.O	WP	O	I-PU
38	P05/SPICLK/PCM_CLK	D.O	NC	O	I-PU
39	P06/SPIDO/PCM_DOUT	D.O	NC	O	I-PU
40	P07/SPIDI/PCM_DIN	D.O	NC	O	I-PU
41	VSS3	-	-	-	-
42	VDD3	-	-	-	-
43	P23/ADC1	A.I	NC	I	I
44	P17/CHARGE/INT7	D.I	INT7	I	I-PD
45	*RST	D.O	RST	O	I-PU
46	VBAT1	A.I	VBAT1	I	I
47	LDO1_CTRL	A.I	LDO1_CTRL	I	I
48	LDO2_CTRL	A.I	LDO2_CTRL	I	I
49	LDO1_Sense	A.I	LDO1_Sense	I	I
50	AVS2	-	-	-	-
51	AVD2	-	-	-	-
52	*CIDIN	A.I	CIDINn	I	I
53	*LSR/REF	A.O	LSRn	O	O
54	LSRp/REF	A.O	LSRp	O	O
55	RINGING	A.I	RINGING	I	I
56	*MIC/CIDOUT	A.O	CIDOUT	O	I
57	VREFm	-	-	-	-
58	AGND	A.O	AGND	O	O
59	MICp	A.I	MICp	I	I

Pin No.	Description	I/O	Connection	at Normal mode	at Reset mode
60	CIDINp	A.I	CIDINp	I	I
61	P14/*INT4	D.O	HOOK	O	I
62	P13/*INT3	D.O	PULSE_CTRL	O	I
63	ADC2	A.I	NC	I	I
64	ADC0	A.I	ADC0	I	I

Pin No.	Description	I/O	Connection	at Normal mode	at Reset mode
60	CIDINp	A.I	CIDINp	I	I
61	P14/*INT4	D.O	HOOK	O	I
62	P13/*INT3	D.O	PULSE_CTRL	O	I
63	ADC2	A.I	NC	I	I
64	ADC0	A.I	ADC0	I	I

14.2. CPU Data (Handset)

14.2.1. IC1 (BBIC)
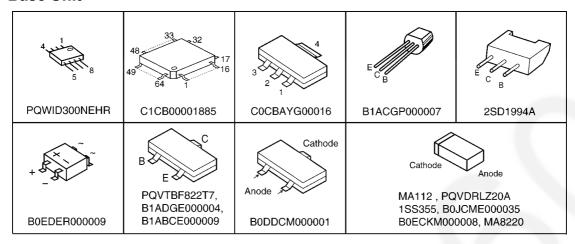
Pin No.	Description	I/O	Connection	at Normal mode	at Reset mode
1	*INT1/P11	D.I	ROW1	I	I-PU
2	VDDIO1	-	VDDIO1	-	-
3	VDD1	-	VDD1	-	-
4	VSS1	-	VSS1	-	-
5	LED1/PWM0/P20	D.O	NC	O	I-PU
6	LED2/PWM1/P21	D.O	LCD_CSB	O	I-PU
7	LED3	A.I	NC	I	I
8	LED_BIAS/P36/PD6	D.O	RESET(RF)	O	I-PD
9	SDA1/P25	D.I/O	NC	O	I
10	SCL1/P24	D.O	NC	O	I
11	*INT5/VDDE/P15	D.O	LCD_CD	O	O-H
12	*INT2/P12	D.I	ROW2	I	I-PU
13	AVD	-	AVD	-	-
14	AVS	-	AVS	-	-
15	CAP	A.I	CAP	I	I
16	Xtal1	A.I	Xtal1	I	I
17	VSSRF	-	VSSRF	-	-
18	RFCLKp	A.O	NC	O	Hi-Z
19	RSSI/RFCLKm	A.I	NC	I	Hi-Z
20	VDDRF	-	VDDRF	-	-
21	RFCLKd	D.O	RFCLKd	O	O-L
22	TDO	A.O	TDO	O	O
23	RDI	D.I	RDI	I	I
24	SK	D.O	SK	O	O-L
25	PD1/SIO	D.I/O	SIO	I/O	I-PD
26	LE	D.O	LE	O	O-L
27	P31/PD1	D.O	COL1	O	I-PD
28	P32/PD2	D.O	COL2	O	I-PD
29	VSSPA1	-	VSSPA1	-	-
30	PAOUTm	A.O	PAOUTm	O	O
31	VDDPA	-	VDDPA	-	-
32	PAOUTp	A.O	PAOUTp	O	O
33	VSSPA2	-	VSSPA2	-	-
34	P33/PD3	D.O	COL3	O	I-PD
35	P34/PD4	D.O	COL4	O	I-PD
36	TDOD/P35/PD5	D.O	COL5	O	I-PD
37	VSS2	-	VSS2	-	-
38	VDDIO2	-	VDDIO2	-	-
39	VDD2	-	VDD2	-	-
40	PCM_FSC/*INT0/P10	D.I	ROW0	I	I-PU
41	P00/UTX	D.O	UTX	O	I-PU
42	P01/URX	D.I	URX	I	I-PU
43	P02/JTIO	D.I/O	JTAG	I/O	I-PU
44	P03/SDA2	D.I/O	SDA2	I/O	I-PU
45	P04/SCL2	D.O	SCL2	O	I-PU
46	P05/SPICLK/PCM_CLK	D.O	LCD_SCL	O	I-PU
47	P06/SPIDO/PCM_DOUT	D.I/O	LCD_SDA	I/O	I-PU
48	P07/SPIDI/PCM_DIN	D.O	RESET(RF)	O	I-PU
49	VSS3	-	VSS3	-	-
50	VDD3	-	VDD3	-	-
51	P23/ADC1	A.I	NC	I	I
52	P17/CHARGE/INT7	D.I	CHARGE	I	I-PD
53	*RST	D.O	nRST	O	I-PU
54	DC_STAB	A.O	DC_STAB	O	O
55	DC_I	A.I	DC_I	I	I
56	DC_CTRL	A.O	DC_CTRL	O	O-PD
57	DC_Sense	A.I	DC_Sense	I	I
58	VBAT1	A.I	VBAT1	I	I
59	LDO1_CTRL	A.I	LDO1_CTRL	I	I
60	LDO2_CTRL	A.I	LDO2_CTRL	I	I
61	P16/PON/INT6	D.I	PON	I	I-PD
62	P26/STOP_CHARGE	A.O	STOP_CHARGE	O	O-L
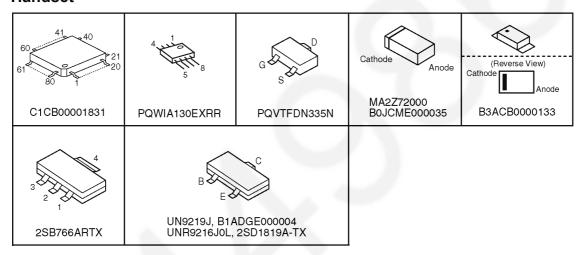
Pin No.	Description	I/O	Connection	at Normal mode	at Reset mode
63	LDO1_Sense	A.I	LDO1_Sense	I	I
64	AVS2	-	AVS2	-	-
65	AVD2	-	AVD2	-	-
66	*LSR/REF	A.O	LSRn	O	O
67	LSRp/REF	A.O	LSRp	O	O
68	*MIC	A.I	MICn	I	I
69	VREFm	-	VREFm	-	-
70	VBUF	A.O	NC	O	O
71	AGND	A.O	AGND	O	O
72	MICp	A.I	MICp	I	I
73	VREFp	A.O	VREFp	O	O
74	P30	D.O	COL0	O	I-PD
75	P14/*INT4	D.O	KEY_LED	O	I
76	P13/*INT3	D.I	ROW3	I	I
77	P22/CLK100	D.O	LCD_RESET	O	I-PD
78	AVS_sense	A.I	AVS_sense	I	I
79	ADC3	A.I	ADC3	I	I
80	ADC0	A.I	ADC0	I	I

14.3. Terminal Guide of the ICs, Transistors and Diodes

14.3.1. Base Unit

PQWID300NEHR	C1CB00001885	C0CBAYG00016	B1ACGP000007	2SD1994A
B0EDER000009	PQVTBF822T7, B1ADGE000004, B1ABCE000009	B0DDCM000001	MA112 , PQVDRLZ20A 1SS355, B0JCME000035 B0ECKM000008, MA8220	

14.3.2. Handset

C1CB00001831	PQWIA130EXRR	PQVTFDN335N	MA2Z72000 B0JCME000035	B3ACB0000133
2SB766ARTX	UN9219J, B1ADGE000004 UNR9216J0L, 2SD1819A-TX			

14.3.3. Charger Unit

B0JAME000095
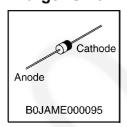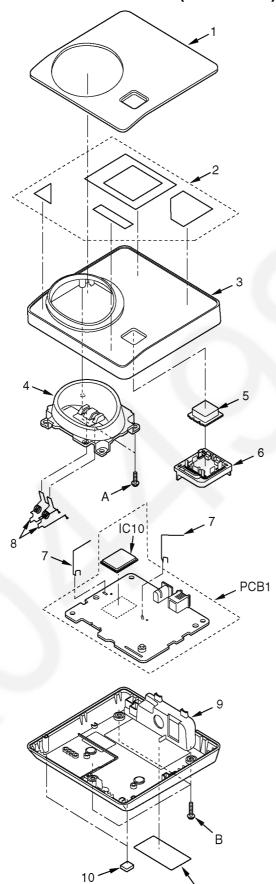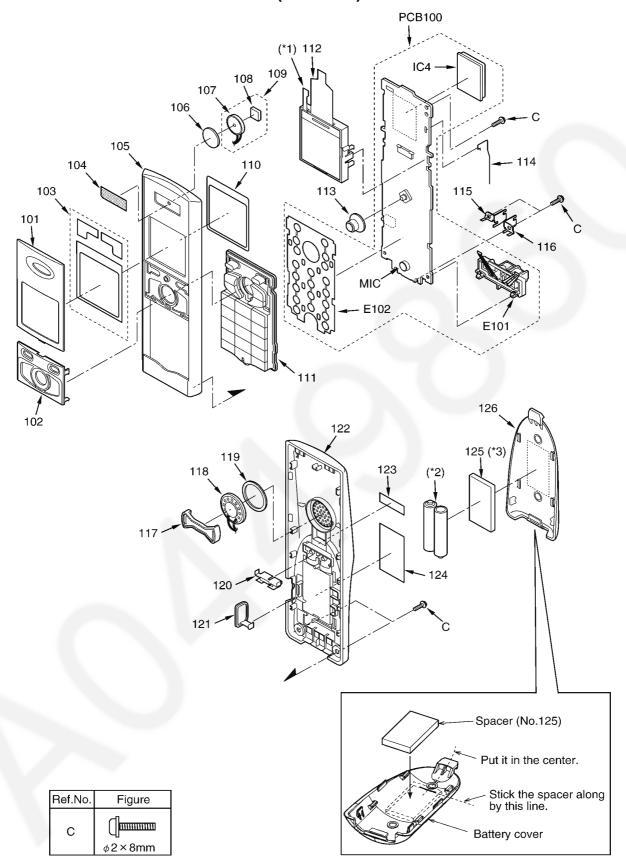
15 Exploded View and Replacement Parts List

15.1. Cabinet and Electrical Parts (Base Unit)

Ref.No.	Figure
A	⌀2.6 × 8 mm
B	⌀2.6 × 12 mm
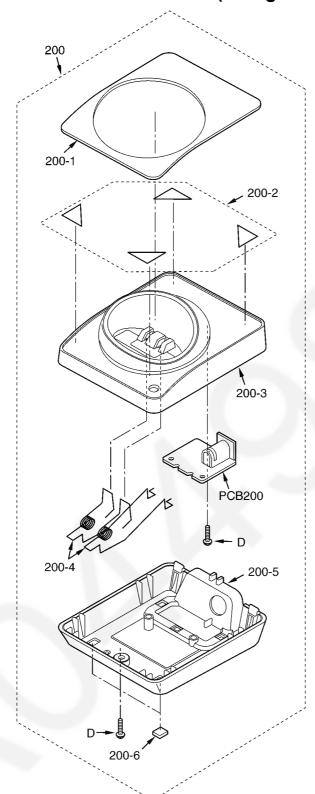
15.2. Cabinet and Electrical Parts (Handset)

Ref.No.	Figure
C	⊐▥▥▥▥▥▥▥▥▥▥ φ2 × 8mm

Note:

(*1) This cable is fixed by soldering. Refer to **Fix the LCD to the Main P.C. Board (Handset)** (P.57).

(*2) The rechargeable Ni-MH battery P03P (HHR-4EPT, Capacity: up to 750 mAh) is available through sales route of Panasonic.

(*3) Attach the spacer (No. 125) to the exact location described above.
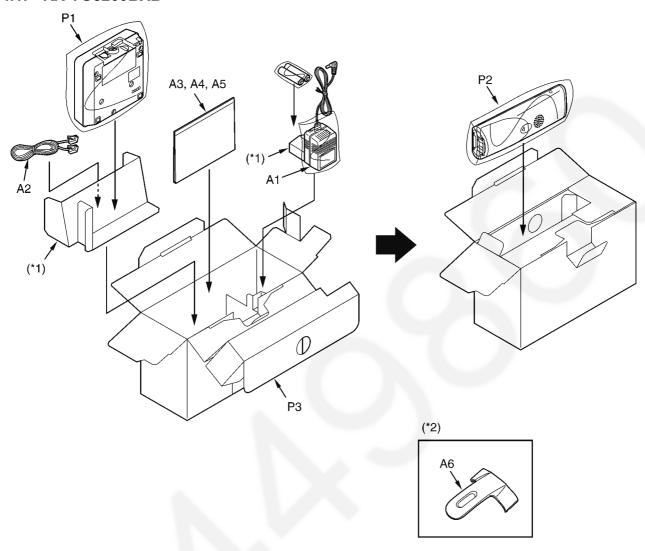
15.3. Cabinet and Electrical Parts (Charger Unit)

200

200-1

200-2

200-3

PCB200

D

200-4

200-5

D

200-6

Ref.No.	Figure
D	$\phi 2 \times 10mm$

87

15.4. Accessories and Packing Materials
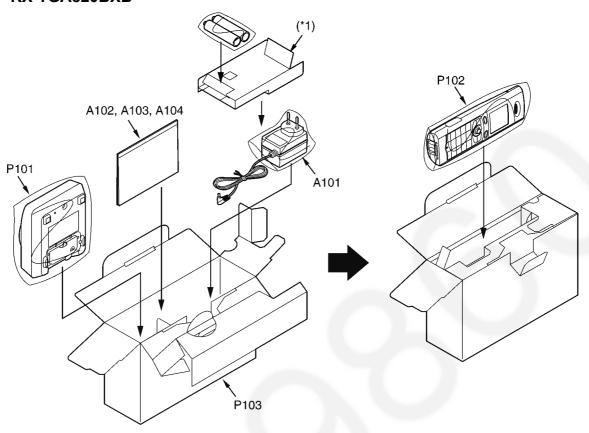
15.4.1. KX-TG8200BXB

Note:
(*1) These pads are pieces of Ref No. P3 (GIFT BOX).
(*2) Optional Accessory
    Model No. for A6 (BELT CLIP) through sales route of Panasonic is KX-TCA828EXB.

15.4.2. KX-TGA820BXB

(*1)

A102, A103, A104

P101

A101

P102

P103

Note:
(*1) This pad is a piece of Ref No. P103 (GIFT BOX).

15.5. Replacement Part List

1. RTL (Retention Time Limited)

   Note:

   The "RTL" marking indicates that its Retention Time is Limited.

   When production is discontinued, this item will continue to be available only for a specific period of time. This period of time depends on the type of item, and the local laws governing parts and product retention. At the end of this period, the item will no longer be available.

2. Important safety notice

   Components identified by the ⚠ mark indicates special characteristics important for safety. When replacing any of these components, only use specified manufacture's parts.

3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.

4. ISO code (Example: ABS-94HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.

5. RESISTORS & CAPACITORS

   Unless otherwise specified;

   All resistors are in ohms (Ω) K=1000 Ω, M=1000 kΩ

   All capacitors are in MICRO FARADS (μF)P=μμF

   *Type & Wattage of Resistor

Type

ERC:Solid	ERX:Metal Film	PQ4R:Chip
ERDS:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
ERJ:Chip	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage Of Capacitor

Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,F1K,ECUV:Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG:Polyester
ECUV,PQCUV,ECUE:Chip	ECEA,ECST,EEE:Electlytic
ECQMS:Mica	ECQP:Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others		
1H:50V	05:50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :16V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

15.5.1. Base Unit

15.5.1.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQGP10329Z1	PANEL	AS-HB
2	PQHS10783Z	TAPE, DOUBLE SIDED	
3	PQKM10767Z1	CABINET BODY	ABS-HB
4	PQKE10479Z1	CASE, CHARGE TERMINAL	PS-HB
5	PQBC10506Z1	BUTTON, LOCATOR	AS-HB
6	PQHR11316Z	GUIDE, LOCATOR BUTTON	ABS-HB
7	PQSA10208Z	ANTENNA	
8	PQJT10259Z	CHARGE TERMINAL	
9	PQKF10747Z1	CABINET COVER	PS-HB
10	PQHA10023Z	RUBBER PARTS, FOOT CUSHION	

Ref. No.	Part No.	Part Name & Description	Remarks
11	PQGT19921Z	NAME PLATE	

15.5.1.2. Main P.C.Board Parts

Note:

(*1) When replacing IC5, IC7 or X1, data needs to be written to them with PQZZTG8200BX. Refer to **Base Unit** (P.65) of **Things to Do after Replacing IC or X'tal.**

(*2) Flash type of BBIC needs software downloading. Refer to **Base Unit** (P.65) of **Things to Do after Replacing IC or X'tal.**

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWPG8200BXH	MAIN P.C. BOARD ASS'Y (RTL)	
		(ICs)	
IC1	C0CBAYG00016	IC	S
IC5	PQWID300NEHR	IC (EEPROM) (*1)	
IC7	C1CB00001885	IC (BBIC (FLASH)) (*1) (*2)	
		(TRANSISTORS)	
Q2	B1ABCE000009	TRANSISTOR(SI)	
Q3	B1ACGP000007	TRANSISTOR(SI)	
Q4	PQVTBF822T7	TRANSISTOR(SI)	
Q5	2SD1994A	TRANSISTOR(SI)	
Q8	B1ADGE000004	TRANSISTOR(SI)	
Q9	B1ADGE000004	TRANSISTOR(SI)	
		(DIODES)	
D1	B0JCME000035	DIODE(SI)	
D3	B0EDER000009	DIODE(SI)	
D4	PQVDRLZ20A	DIODE(SI)	S
D9	1SS355	DIODE(SI)	S
D12	MA112	DIODE(SI)	S
D22	B0ECKM000008	DIODE(SI)	
D23	MA8220	DIODE(SI)	S
DA1	B0DDCM000001	DIODE(SI)	
		(COILS)	
L1	PQLQXF330K	COIL	S
L2	PQLQXF330K	COIL	S
L7	G1C1N5Z00007	COIL	
		(JACKS)	
CN1	K2LB102B0053	JACK, MODULAR	
CN2	K2ECYB000001	JACK, DC	
		(RESISTORS)	
R1	ERJ2GEJ103	10K	
R3	ERJ3GEYJ184	180K	
R4	ERJ3GEYJ105	1M	
R5	ERJ3GEYJ184	180K	
R6	ERJ3GEYJ105	1M	
R8	ERJ3GEYJ104	100K	
R10	ERJ3GEYJ104	100K	
R12	ERJ2GEJ103	10K	
R13	ERJ2GEJ681	680	
R14	ERJ3GEYJ104	100K	
R15	PQ4R10XJ272	2.7K	S
R16	ERJ2GEJ103	10K	
R17	ERJ2GEJ222	2.2K	
R18	ERJ2GEJ273X	27K	
R19	ERJ2GEJ822	8.2K	
R20	ERJ2GEJ392	3.9K	
R21	ERJ12YJ120	12	
R22	ERJ12YJ270	27	
R23	ERJ2GEJ104	100K	
R24	ERJ2GEJ473	47K	
R27	ERJ2GEJ104	100K	
R28	ERJ2GEYJ474	470K	S
R29	ERJ2GEJ121	120	
R30	ERJ3GEYJ820	82	
R31	ERJ3GEYJ821	820	
R32	ERJ2GEJ104	100K	
R33	ERJ2GEJ102	1K	
R34	ERJ2GEJ104	100K	
R35	ERJ2GEJ102	1K	

Ref. No.	Part No.	Part Name & Description	Remarks
R36	ERJ2GEJ104	100K	
R38	ERJ2RKF1200	120	
R39	ERJ2RKF2000	200	
R55	ERJ1TYJ3R9U	3.9	
R56	ERJ1TYJ3R9U	3.9	
R57	ERJ1TYJ3R3U	3.3	
R62	ERJ2GEJ222	2.2K	
R63	ERJ2GEJ222	2.2K	
R71	ERJ2GEJ332	3.3K	
R72	ERJ2GEJ150	15	
R73	ERJ2GEJ335	3.3M	
R74	ERJ2GEJ103	10K	
R75	ERJ2GEJ101	100	
R76	ERJ2GEJ102	1K	
R77	ERJ2GEJ103	10K	
R78	ERJ2GEJ103	10K	
R79	ERJ2GEJ102	1K	
R80	ERJ2GEJ102	1K	
R81	ERJ2GEJ332	3.3K	
R97	ERJ2GE0R00	0	
R106	ERJ3GEYJ181	180	
R109	ERJ3GEYJ181	180	
R111	ERJ2GEJ331	330	
R112	ERJ2GEJ102	1K	
R116	ERJ2GEJ101	100	
R117	ERJ2GEJ332	3.3K	
R124	PQ4R18XJ100	10	S
R125	ERJ12YJ1R0	1	
R129	ERJ3GEYJ103	10K	
R130	ERJ3GEYJ102	1K	
R131	ERJ2GEJ101	100	
R133	ERJ2GEJ120	12	
L9	ERJ2GEJ391	390	
L22	ERJ2GE0R00	0	
P1	ERDS1VJ000	0	S
		(CAPACITORS)	
C1	ECUE1H100DCQ	10P	
C3	F1B2H152A048	0.0015	
C4	F1B2H152A048	0.0015	
C5	ECUV1H102KBV	0.001	
C6	ECUV1H102KBV	0.001	
C9	F1B2H681A070	680P	
C10	F1B2H681A070	680P	
C14	ECUE1E472KBQ	0.0047	
C17	PQCUV1A225KB	2.2	
C18	ERJ3GEYJ682	6.8K	
C22	PQCUV1A105KB	1	
C23	ECJ0EB0J224K	0.22	S
C25	ECUE1C103KBQ	0.01	
C27	F2G1H1000009	10	
C31	PQCUV1A225KB	2.2	
C32	ECEA1CK101	100	S
C36	ECEA0JKA331	330	
C50	ECUE1C103KBQ	0.01	
C51	ECUE1A104KBQ	0.1	
C52	ECUE1H221JCQ	220P	
C53	ECUE1H221JCQ	220P	
C54	ECUE1C223KBQ	0.022	
C55	ECUE1A104KBQ	0.1	
C56	ECUV1C104KBV	0.1	
C59	ECUE1A104KBQ	0.1	
C60	ECUE1A104KBQ	0.1	
C61	ECUE1A104KBQ	0.1	
C62	ECUE1H220JCQ	22P	
C63	ECJ0EC1H080C	8P	S
C64	F2G1C1000014	10	
C65	ECUE0J105KBQ	1	
C67	ECUE1A104KBQ	0.1	
C68	ECUE0J105KBQ	1	
C70	ECUV1A105KBV	1	
C71	F2G1C1000014	10	
C72	ECUE1A224KBQ	0.22	
C73	ECUE1A104KBQ	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C74	ECUE1A104KBQ	0.1	
C75	ECUE1A104KBQ	0.1	
C96	ECUE1H102KBQ	0.001	
C103	ECUE1H100DCQ	10P	
C106	ECUE1H100DCQ	10P	
C108	PQCUV0J475MB	4.7	
C110	ECUE1H100DCQ	10P	
C112	ECUE1H220JCQ	22P	
C117	ECUE1H7R0DCQ	7	
C118	ECUV1H100DCV	10P	
C124	ECUE1H7R0DCQ	7	
C125	ECUV1H100DCV	10P	
C126	ECUE1H151JCQ	150P	
C127	ECUE1H102KBQ	0.001	
C128	ECUE1H391KBQ	390P	
C136	ECUE1H100DCQ	10P	
C137	ECUE1H100DCQ	10P	
C141	ECJ0EB0J224K	0.22	S
C157	ECUE1H102KBQ	0.001	
C162	ECUE1H3R0CCQ	3P	
C164	ECUV1H100DCV	10P	
C165	ECUV1H100DCV	10P	
L21	ECUE1H220JCQ	22P	
		(OTHERS)	
IC10	PQLP10293Z	RF UNIT	
SA1	J0LF00000026	VARISTOR (SURGE ABSORBER)	
SW1	K0H1BA000259	SPECIAL SWITCH	
F1	K5H302Y00003	FUSE	
X1	H0J103500022	CRYSTAL OSCILLATOR (*1)	

15.5.2. Handset

15.5.2.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
101	PQGP10327Z1	PANEL, LCD	AS-HB
102	PQGG10421Z1	GRILL, BUTTON	ABS-HB
103	PQHS10778Z	TAPE, DOUBLE SIDED	
104	PQGS10004Z	NET, RECEIVER SHEET	
105	PQKM10769Z1	CABINET BODY	ABS-HB
106	PQHS10781Z	COVER, RECEIVER NET	
107	L0AD01A00014	RECEIVER	
108	PQHG10756Z	RUBBER PARTS, RECEIVER	
109	PQWHTGA820ER	RECEIVER ASS'Y	
110	PQHS10780Z	SPACER, LCD CUSHION	
111	PQYT10021W1	KEYBOARD SWITCH	
112	PQLP10312Z	LIQUID CRYSTAL DISPLAY	
113	PQBC10427Z2	BUTTON, JOYSTICK	ABS-HB
114	PQSA10207Z	ANTENNA	
115	PQJT10254Z	CHARGE TERMINAL (R)	
116	PQJT10253Z	CHARGE TERMINAL (L)	
117	PQHR11315Z	GUIDE, SPEAKER	ABS-HB
118	L0AA02A00048	SPEAKER	
119	PQHS10784Y	SPACER, SPEAKER NET	
120	PQJC10056X	BATTERY TERMINAL	
121	PQKE10480Z1	COVER, E/P	ELAS-TOMER-HB
122	PQKF10749Z1	CABINET COVER	ABS-HB
123	PQQT23182Z	LABEL, ATTENTION	
124	PQGT20060Z	NAME PLATE	
125	PQHS10795Z	SPACER, BATTERY COVER	
126	PQKK10604Z1	LID, BATTERY COVER	ABS-HB

15.5.2.2. Main P.C.Board Parts

Note:

(*1) When replacing IC1, IC3 or X1, data needs to be written to them with PQZZTG8200BX. Refer to **Handset** (P.66) of **Things to Do after Replacing IC or X'tal.**

(*2) Flash type of BBIC needs software downloading. Refer to **Handset** (P.66) of **Things to Do after Replacing IC or**

X'tal.

Ref. No.	Part No.	Part Name & Description	Remarks
PCB100	PQWPGA820BXR	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICs)	
IC1	C1CB00001831	IC(BBIC(FLASH)) (*1) (*2)	
IC3	PQWIA130EXRR	IC (EEPROM) (*1)	
		(TRANSISTORS)	
Q1	PQVTFDN335N	TRANSISTOR(SI)	S
Q2	B1ADGE000004	TRANSISTOR(SI)	
Q3	B1ADGE000004	TRANSISTOR(SI)	
Q4	2SB766ARTX	TRANSISTOR(SI)	S
Q5	UNR9216J0L	TRANSISTOR(SI)	
Q7	UN9219J	TRANSISTOR(SI)	S
Q9	UN9219J	TRANSISTOR(SI)	S
Q12	UN9219J	TRANSISTOR(SI)	S
Q23	2SD1819A-TX	TRANSISTOR(SI)	S
		(DIODES)	
D1	B0JCME000035	DIODE(SI)	
D7	MA2Z72000	DIODE(SI)	
LED4	B3ACB0000133	LED	
LED5	B3ACB0000133	LED	
LED6	B3ACB0000133	LED	
LED7	B3ACB0000133	LED	
LED8	B3ACB0000133	LED	
LED9	B3ACB0000133	LED	
LED10	B3ACB0000133	LED	
LED11	B3ACB0000133	LED	
		(COILS)	
F1	PQLQR2M5N6K	COIL	S
L1	G1C470M00025	COIL	
		(IC FILTERS)	
L7	J0JCC0000275	IC FILTER	
L21	J0JCC0000286	IC FILTER	
L22	J0JCC0000277	IC FILTER	
L23	J0JCC0000276	IC FILTER	
		(CONNECTOR AND JACK)	
CN3	K1MN13BA0134	CONNECTOR	
CN4	K2HD103D0001	JACK	
		(COMPONENTS PARTS)	
RA3	D1H447120002	RESISTOR ARRAY	
RA4	D1H447120002	RESISTOR ARRAY	
RA5	D1H447120002	RESISTOR ARRAY	
RA6	D1H447120002	RESISTOR ARRAY	
		(VARISTORS)	
D8	D4ED1270A014	VARISTOR	
C70	D4ED1270A014	VARISTOR	
C71	D4ED1270A014	VARISTOR	
C101	D4ED1270A014	VARISTOR	
C102	D4ED1270A014	VARISTOR	
		(RESISTORS)	
R1	ERJ6RSJR10V	0.1	
R2	ERJ3GEYJ680	68	
R5	ERJ2GEJ471	470	
R6	ERJ3GEYJ103	10K	
R7	ERJ3GEYJ224	220K	
R11	ERJ2GEJ393X	39K	
R12	ERJ2GEJ4R7	4.7	
R13	ERJ2GEJ101	100	
R15	ERJ2GEJ332	3.3K	
R23	ERJ2GEJ471	470	
R24	ERJ2GEJ332	3.3K	
R25	ERJ2GEJ222	2.2K	
R32	ERJ2GEJ104	100K	
R33	ERJ2GEJ104	100K	
R40	ERJ2GEJ103	10K	
R41	ERJ2GEJ103	10K	
R45	ERJ6RSJR10V	0.1	
R46	ERJ2GEJ562X	5.6K	
R47	ERJ2GEJ562X	5.6K	
R52	ERJ2GEJ102	1K	
R61	ERJ2GEJ102	1K	
R62	ERJ2GEJ102	1K	

Ref. No.	Part No.	Part Name & Description	Remarks
R63	ERJ2GEJ101	100	
R64	ERJ2GEJ103	10K	
R65	ERJ2GEJ103	10K	
R66	ERJ2GEJ102	1K	
R71	ERJ3GEYJ470	47	
R103	ERJ2GEJ101	100	
R104	ERJ2GEJ101	100	
R105	ERJ2GEJ101	100	
R106	ERJ2GEJ101	100	
R107	ERJ2GEJ101	100	
R151	ERJ2GEJ271	270	
R153	ERJ2GE0R00	0	
R157	ERJ2GE0R00	0	
R158	ERJ2GE0R00	0	
R167	ERJ2GE0R00	0	
R170	ERJ2GEJ331	330	
R175	ERJ2GE0R00	0	
R176	ERJ2GE0R00	0	
R181	ERJ2GE0R00	0	
R182	ERJ3GEY0R00	0	
R183	ERJ2GEJ103	10K	
R186	ERJ2GE0R00	0	
R192	ERJ2GE0R00	0	
R196	ERJ2GE0R00	0	
R197	ERJ2GEJ473	47K	
R199	ERJ2GEJ473	47K	
R200	ERJ2GEJ473	47K	
R201	ERJ2GEJ104	100K	
		(CAPACITORS)	
C1	EEE0GA331WP	330	
C2	EEE0JA331P	330	
C3	ECUE1A104KBQ	0.1	
C6	ECUE1H8R0DCQ	8P	
C7	ECUE1H120JCQ	12P	
C8	ECUE1A224KBQ	0.22	
C10	ECUV1A225KB	2.2	
C11	ECUE1A104KBQ	0.1	
C12	ECST0JY226	22	S
C14	ECUE1H100DCQ	10P	
C15	ECUV1A105KBV	1	
C18	ECUE1H102KBQ	0.001	
C19	ECUE0J105KBQ	1	
C20	ECUE1A104KBQ	0.1	
C21	ECUE1A104KBQ	0.1	
C22	ECUE0J105KBQ	1	
C23	ECUE1H101JCQ	100P	
C24	ECUE1A104KBQ	0.1	
C25	ECUE1A104KBQ	0.1	
C26	ECUV1C104KBV	0.1	
C27	ECUE0J105KBQ	1	
C29	ECUV1A105KBV	1	
C30	ECUE1A104KBQ	0.1	
C34	ECUE0J105KBQ	1	
C35	ECUE1H101JCQ	100P	
C36	ECUE1H102KBQ	0.001	
C38	ECUE1C103KBQ	0.01	
C39	ECUV1A225KB	2.2	
C51	ECUE1H391KBQ	390P	
C52	ECUE1H102KBQ	0.001	
C53	ECUE1H151JCQ	150P	
C57	ECUE1H390JCQ	39P	
C59	ECUE1H100DCQ	10P	
C62	ECUE1H100DCQ	10P	
C72	ECUE1H100DCQ	10P	
C84	ECUE1A104KBQ	0.1	
C86	F3F0J4760005	47	
C98	ECUE1H102KBQ	0.001	
C103	ECUE1H101JCQ	100P	
C104	ECUE1H101JCQ	100P	
C105	ECUE1H101JCQ	100P	
C107	ECUE1H101JCQ	100P	
C119	ECUE1A104KBQ	0.1	
C120	ECUE1C103KBQ	0.01	

Ref. No.	Part No.	Part Name & Description	Remarks
C121	ECUE1A104KBQ	0.1	
C122	ECUE1H100DCQ	10P	
C163	ECUE1H100DCQ	10P	
C165	ECUE1H3R0CCQ	3P	
C166	ECUE1H471KBQ	470P	
C168	ECUE1A104KBQ	0.1	
C173	ECUE1H101JCQ	100P	
C174	ECUE1H101JCQ	100P	
C175	ECUE1H101JCQ	100P	
C176	ECUE1H101JCQ	100P	
C177	ECUE1H151JCQ	150P	
C178	ECUE1H100DCQ	10P	
C179	ECUV1H100DCV	10P	
C180	ECUE1H331KBQ	330P	
		(OTHERS)	
MIC	L0CBAB000104	MICROPHONE	
E101	PQWE10050Z	BATTERY TERMINAL	ABS-HB
E102	PQSE10033Z	SPECIAL SWITCH, SHEET	
IC4	PQLP10293Z	RF UNIT	
SW1	K0C115A00006	SEESAW SWITCH	
X1	H0J103500023	CRYSTAL OSCILLATOR (*1)	

15.5.3. Charger Unit

15.5.3.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
200	PQLV30056ZB	CHARGER UNIT ASS'Y (RTL)	
200-1	PQGP10330Z1	PANEL	AS-HB
200-2	PQHS10779Z	TAPE, DOUBLE SIDED	
200-3	PQKM10768Z1	CABINET BODY	ABS-HB
200-4	PQJT10252Y	CHARGE TERMINAL	
200-5	PQKF10748Z1	CABINET COVER	PS-HB
200-6	PQHA10023Z	RUBBER PARTS, FOOT CUSHION	

15.5.3.2. Main P.C.Board Parts

Ref. No.	Part No.	Part Name & Description	Remarks
PCB200	PQWPTGA721CH	MAIN P.C.BOARD ASS'Y (RTL)	
		(DIODE)	
D1	B0JAME000095	DIODE(SI)	
		(JACK)	
J1	K2ECYB000001	JACK	S
		(RESISTOR)	
R1	ERG2SJ100E	10	
		(FUSE)	
F1	K5H302Y00003	FUSE	

15.5.4. Accessories and Packing Materials
Note:

(*1) You can download and refer to the Operating Instructions (Instruction book) on TSN Server.

15.5.4.1. KX-TG8200BXB

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQLV207BXZ	AC ADAPTOR	⚠
A2	PQJA10075Z	CORD, TELEPHONE	
A3	PQQX16114Z	INSTRUCTION BOOK (*1)	
A4	PQQW15796Z	LEAFLET, QUICK GUIDE (for Arabic)	
A5	PQQW15797Z	LEAFLET, QUICK GUIDE (for Persian)	
A6	PQKE10481Z1	HANGER, BELT CLIP (for Service)	PC+ABS-HB
P1	PQPH10103Z	PROTECTION COVER (for Base Unit)	

Ref. No.	Part No.	Part Name & Description	Remarks
P2	PQPH10088Z	PROTECTION COVER (for Handset)	
P3	PQPK16051Z	GIFT BOX	

15.5.4.2. KX-TGA820BXB

Ref. No.	Part No.	Part Name & Description	Remarks
A101	PQLV209BXZ	AC ADAPTOR	⚠
A102	PQQX16150Z	INSTRUCTION BOOK (for English) (*1)	
A103	PQQX16151Z	INSTRUCTION BOOK (for Arabic) (*1)	
A104	PQQX16152Z	INSTRUCTION BOOK (for Persian) (*1)	
P101	PQPH10101Z	PROTECTION COVER (for Charger Unit)	
P102	PQPH10088Z	PROTECTION COVER (for Handset)	
P103	PQPK16062Z	GIFT BOX	

15.5.5. Screws

Ref. No.	Part No.	Part Name & Description	Remarks
A	XTW26+T8PFJ	TAPPING SCREW	
B	XTW26+T12PFJ	TAPPING SCREW	
C	XTW2+R8PFJ	TAPPING SCREW	
D	XTW2+R10PFJ	TAPPING SCREW	

15.5.6. Fixtures and Tools
Note:

(*1) See **The Setting Method of JIG (Base Unit)** (P.58), and **The Setting Method of JIG (Handset)** (P.62).

Part No.	Part Name & Description	Remarks
PQZZ1CD300E	JIG CABLE (*1)	
PQZZTG8200BX	BATCH FILE CD-ROM (*1)	

H.M
KXTG8200BXB
KXTGA820BXB